32 Libraries:
Opportunities and Challenges

By Warren and Mahoney
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Acknowledgements

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The cover photography features the National Library of New Zealand, a project delivered by Warren and Mahoney.

About Warren and Mahoney

Warren and Mahoney is one of the ten largest architecture practices in Australasia. 65 years of experience has taught us that nothing great is made alone. Design isn't a process, it's a partnership, and the best way to work is to work together. Together, everything is possible. Working at the intersection of culture, sustainability, and technology, Warren and Mahoney's design and consulting services and sector expertise deliver innovative solutions our clients, and communities across the Pacific Rim.

In 2024, for the third year in a row, Warren and Mahoney was awarded a prestigious WAFX Award at the World Architecture Festival. WAFX awards projects that best use design and architecture to tackle major world issues, including health, climate change, technology, ethics and values. This recognition follows Warren and Mahoney being named in Fast Company's 2023 Top 10 Most Innovative Architectural Practices worldwide.

Our belief that the architecture should be future-focused - responsive to the needs of today and the challenges of tomorrow. Our specialist education team has designed and delivered some of Australasia's most influential, sustainable, and award-winning educational spaces spanning typologies and pedagogies. We seek out projects that matter, with bold, future-focused clients committed to driving positive change.

Warren and Mahoney bring extensive experience in the design of both libraries and tertiary education facilities. Over the last 20 years this work has included: the refurbishment of the New Zealand National Library, the design of the New Zealand National Archives, major projects on 15 different university or tertiary campuses and 17 community libraries.

For more information about the Future Libraries study and Warren and Mahoney library projects please contact:

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Principal

Born in Vancouver, trained in London and living in New Zealand, Graeme has led successful projects in the UK, Canada, China, Australia and New Zealand. In his 20 years with Warren and Mahoney he has held the roles of education specialist, sustainability lead, Principal, board member and Group Chair.

He is a strategist, master planner and project leader. His portfolio of projects ranges from $1 million to $400 million and includes the masterplanning and design of key university facilities and a number of community libraries. Recent library projects have included the development of the strategic vision for the library of a major Australian research university and participation as a key team member in the Future of the Library research study.

Andrew Harrison
Consulting Principal and Tertiary Library Specialist

Andrew is an international specialist and author in education design and strategy. He has worked with tertiary institutions in the United Kingdom, Europe, Asia, Africa and Australasia developing strategic briefs for new university campuses and individual academic buildings. His strategic work for libraries includes the British Library and university libraries in the United Kingdom, Ireland, Turkey, Australia, Africa and India. Research interests focus on the intersection between space, pedagogy and technology and publications include 'Design for the changing educational landscape: space, place and the future of learning' (Routledge 2014).

In 2023-2024, he led the Future of the Library research study exploring how academic libraries support universities' strategic visions and learning goals. He continues to work internationally with university library leadership teams on the development of strategic visions and briefs for library refurbishment and redevelopment projects.

Simon Topliss
Principal

Based in Melbourne, Simon is an industry recognised education specialist, and sustainability leader. Simon is the joint lead of the Warren and Mahoney Learn sector. His proven experience collaborating with university stakeholders and students brings immense value to his projects.

He is a leading advocate for the use of low-carbon innovations like mass-timber construction and 'Passive House' design and committed to reducing the embodied and lifecycle carbon of every project. His recent projects include a campus wide strategy for the renewal of learning spaces in Melbourne and a new student accommodation building for First Nations in Sydney.

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Executive Summary

While the library is widely recognised as an essential piece of infrastructure in every university, its potential to support a university in achieving its strategic goals appears to often be underestimated. With the right mission the library can play a pivotal role in relation to improving research outcomes, student experience, welfare and learning outcomes as well as supporting the advancement of digital scholarship, AI, and interdisciplinary research.

The academic library is at a critical point in its evolution. Without books, what is a library? When informal study spaces are appearing in every department across the campus, what is the library's role in providing space for study? When knowledge is available digitally and accessed through the internet or AI, what is the role of the library in the distribution of knowledge? In a post-COVID world what role can the library play in the campus culture and delivering the strategic vision of the university?

Are radically different models of the future library now possible, if not likely, in the future?

These questions, and more, led to our study of the future of the academic library. The study involved interviews with senior leaders of 32 university library systems in New Zealand, Australia, Hawai'i, Canada, United Kingdom and Europe. The key findings from the study are summarised in this report. They will also be presented at a CAUL/CONZUL webinar and conferences in New Zealand and Australia where future priorities for research and tools development to support the development of future models of the academic library will be discussed.

Summary of key findings from the library discussions and desk research.

1. Enhancing the student experience to maximise student success

The library continues to be a critical element of the overall student experience with students seeing the library as a safe and welcoming place on campus – a home from home – that is more than just a study destination. Students in cramped or uncomfortable accommodation spend many hours in the library and the library spaces services, and events must support the students' study, social and welfare needs. The library provides students with a sense of belonging and without that sense of belonging, students are much less likely to stay enrolled or be engaged.

The libraries in the study all had the support of their learning community at the heart of their mission and they provided a range of face-to-face and online study, research and writing skills classes for students. There was widespread recognition that the study landscape within the library had to be inclusive, welcoming and safe for all students and this was reflected in some libraries by the creation of dedicated spaces for students who identify as neurodiverse, disabled, LGBTQ+ etc. Other libraries aimed to make all spaces within the library welcoming to everyone, providing a range of study settings to meet all needs while creating several neighbourhood spaces, combining collection and study space, that become gathering spaces for various student communities.

2. Managing the collection

All libraries in the study reported that a very high percentage of library collections expenditure was allocated to the maintenance or acquisition of digital resources such as e-books or e-journals. The importance of the library's physical collection varied, depending on the type of institution – from teaching focused institutions through to legal deposit libraries.

Almost all the libraries are engaged in actively reviewing and reducing their physical collections (50% reduction target was common) to create more space for additional study seats or other facilities.

While the use of the physical book and journal collection has reduced dramatically – several libraries reported students taking out less than one book per year – students still value the presence of the collection as it signals scholarly intent and encourages students to focus and study. The remaining book stacks also have other functions in terms of defining zones of space within the library and providing a level of acoustics separation between these zones.

3. Celebrating the importance of the Special Collections

As the general collections have decreased, many of the libraries in the study were exploring ways to give increased prominence to their special collections and rare books, given that these items are often institutional treasures and the USP of the library. Increasingly, these cultural collections also create opportunities for object-based learning and digital scholarship. Special Collections spaces and the associated reading rooms are being re-located to more prominent locations within the library, the reading room is being enhanced to include exhibition and display spaces, teaching, and research spaces to support object-based learning as well as digital scholarship activities such as digitisation and visualisation.

4. Creating spaces to support learning and teaching innovation

Learning and teaching approaches at universities have changed radically in recent years with a shift to more active, collaborative learning with students increasingly working together on projects, often involving the development of presentations, videos, performance, and the development of prototypes. Accelerated by COVID, the traditional lecture has become less common with the delivery of lecture content on-line and face-to-face time being used for 'higher learning value' tasks such as discussions, case study analysis or student seminars. Many classes are also held on-line, in part or completely, with students actively participating in seminars and other activities on-line.

The libraries are playing a major role in the delivery of the new learning and teaching approaches through the provision of a rich study landscape to support both individual and collaborative working. The creation of study settings to support active participation in online classes by students has been a challenge that most of the libraries in the study have met successfully through the creation of zoned study areas or the provision of additional individual study rooms or study settings with a degree of visual and acoustic privacy.

While the provision of group study spaces continues to be important these are often available elsewhere on campus in faculty spaces or student centres. It was reported by many of the libraries in the study that students are increasingly asking for additional individual quiet/ silent study spaces in the library that are fit-for-purpose and able to support the use of multiple devices.

The management of the informal study spaces outside of the library was seen as an important issue by many of the libraries in the study. Frequently these spaces in Faculty buildings are not actively managed or staffed and the quality of the spaces may degrade over time due to lack of maintenance or technology support. While several of the library leadership teams said they were reluctant to take on the management of these spaces within their current staff and budget constraints, it was felt that there needed to be an overall campus study space strategy to ensure the equitable provision of a high-quality student study experience across the university.

5. Enhancing university research and innovation

The role of the library staff in providing students with the skills they need to navigate the knowledge universe is still valued by students at all levels. Libraries lead the way in digital and data literacy through both on-line and face-to-face classes and consultation sessions. Increasingly, self-help digital resources are available to solve simple problems, freeing library staff to work with students and faculty on more complex problems.

All the libraries in the study played a major role in their institution's research activities in terms of supporting HDR students through the provision of on-line and face-to-face research skills classes and one-on-one research consultations and the active participation of library staff in faculty research projects.

At an institutional level many of the libraries in the study played a critical role in the establishment and management of data repositories, open-access publishing, and the development of open education resources and bibliometrics to establish impact and increase the reach of the University's research activities.

The libraries in the study varied widely in terms of the provision and success of dedicated post-graduate study and research spaces for HDR students. Provision ranged from no defined HDR spaces through to bookable study carrels, postgraduate reading rooms, and postgraduate common rooms containing both study and social spaces combined with access to library and research expertise. The level of provision in the library often depended on what space was also available for HDR students in the Faculties.

The contribution of the libraries to the university's innovation and enterprise goals was explored during the discussions with the library leadership teams. This seems to be an under-developed opportunity for the libraries, with very few of the libraries actively engaging with industry or supporting the creation and development of university or community-led businesses. The exception was one university that provides on-line support for community business start-ups and staffs an Innovation Library at a nearby public library.

Possible opportunities for future libraries include the direct provision of business incubator/ accelerator spaces and services, the hosting of library events with local businesses and the creation of co-working spaces that support both students and community businesses.

6. Championing digital scholarship

The provision of data scholarship services and spaces within the library also varied widely. Many libraries are focusing on 'below-the-waterline' digital scholarship activities such as research support, data repository management, meta-data development, open access publishing and digitisation. Makerspaces have been incorporated into some of the libraries and these generally either focus on rapid prototyping and design thinking or on digital media production, including video/ sound studios, data visualisation spaces and AR/VR/ AI applications development. The Makerspaces also vary in terms their level of integration with curriculum delivery, their recreational role in support of general student well-being and level of library staff support for the Makerspace.

Many of the libraries in this study were already heavily involved in initiatives to understand how best to incorporate AI applications within the institutions learning, teaching and research activities and make use of these applications to gain new insights from their digital collections. As AI is making traditional forms of assessment such as essays and assignments less useful or valid, there is an increasing requirement for facilities to support students in the production of non-traditional assessment outputs such as producing posters, podcasts, models, prototypes and videos. Several of the libraries in the study already provide digital media production facilities for staff and students and the need for these spaces is likely to increase in the future.

Concerns were raised by several libraries about duplication of digital scholarship spaces in the library with other similar facilities located in the Faculties, about the capital cost and ongoing running costs associated with dedicated digital scholarship spaces as well as the requirement for new skills within the library workforce.

However other universities believed that the library – as an accessible, central space on campus – was the best location for Digital Scholarship Centre as it increased access to expensive resources by students and researchers from across the university and beyond rather than limiting use to the Faculty of College that 'owned' the digital scholarship technology and resources. The creation of a high-profile digital scholarship centre within the library could also act as an attractor for both students and faculty and provide opportunities for additional research funding for interdisciplinary projects.

7. Creating an inclusive and welcoming library experience

Support of Indigenous cultures varied widely across the libraries in the study, ranging from the inclusion of Indigenous artworks within the library, the re-naming of the library and library spaces through to decolonization of the library's collections, the employment of Indigenous library staff to support the Indigenous collections and decolonisation initiatives and the creation of dedicated First Nations spaces. Other libraries aimed instead to make all areas of the library welcoming and inclusive to First Nations students rather than creating a dedicated space for these students.

Creating an inclusive and welcoming library requires more than just the provision of dedicated spaces to support specific groups of students. All aspects of the building should be considered including the overall building form, the choice of materials, the entry experience, the zoning of spaces and the provision of a rich landscape of study and social settings that will enable all students to find a place where they are comfortable and that meets their needs at that point of time.

The events that are held in the library are also an important element of an inclusive library – welcoming new students into an unfamiliar environment and engaging with diverse student and external communities through events, performances, and exhibitions.

8. Engaging with the community

Library strategies often include statements about inclusion, widening access to the library and engagement with the local community, building on the mission, values and strategic priorities outlined in the overarching university strategies. Strategies to enhance community access to the library's Special Collections and the First Nations resources and artefacts are often highlighted.

The physical form that this widening access and enhanced community engagement takes in the library is, to some extent dependent on the nature of the university and the location of the libraries. Urban universities may be more closely connected and integrated with the surrounding community, perhaps sharing cultural and sports facilities, compared to suburban and rural campuses that can discrete, bounded campuses that may not be so easily accessed by the community who may not feel that they belong on the campus or in the library.

Many of the libraries that participated in this study welcomed high school students who wanted to use the library study spaces for homework or exam study and several of the Australian libraries in this study operated joint libraries with schools and TAFE (Technical and Further Education) institutions.

Providing community user membership that gives people access to the library spaces and resources – often including access to electronic resources on specific public access computers – was common across the libraries.

However, the challenge faced by several of the libraries was to make the local community feel welcome in the library and know that they can access the spaces and use library resources. Holding events and activities in the library, including the co-creation of exhibitions with students, was seen as a useful way of achieving this.

University libraries' exhibitions and public programs play an important role, as part of a broader cultural heritage eco-system, in showcasing university research in new ways and to new audiences, often supporting new interdisciplinary connections and expanding community engagement.

Community engagement can also operate at a local, national and an international level – particularly where a library's collections are unique or of global significance. As well as making the collections available in the library or the creation of exhibitions and displays in the library spaces, the libraries in this study are all making their Special Collections accessible through digitisation programmes and the creation of on-line exhibitions and other digital resources.

9. Intensifying focus on sustainability, climate change and the future of the planet

The libraries in the study all supported their university's sustainability plan and targets and actively contributed where they could in terms of energy consumption, recycling, furniture and other materials choices, planting both outside and in the library and use of local suppliers for food etc. but in some cases, they were hampered by the challenges of the existing library buildings.

Many of the libraries in the study were also aware of the carbon impacts of their digital collections and data repositories and were actively trying to reduce this carbon load through careful vendor selection and the minimization of what is being stored.

The libraries also make major contributions to the meeting of institutional targets for the United Nations Sustainable Development Goals through promoting information and digital literacy, equity of access to information, communication of the knowledge created in the university, providing access to digital collections and the world's culture and heritage.

Several universities in the study discussed the opportunity to make their libraries 'living labs' – to use the buildings to explain how they were contributing to combating climate change and through creating exhibitions and events programmes as part of their student engagement programme.

Realising the future library

Establishing a strategy for the physical development of the future library – whether this involves a sequential renovation of library spaces, significant redevelopment of the existing library building or the construction of a new library - involves a sequential process.

These steps are likely to include:

1 Establishing the role of the library within the university's strategy

Exploring how the future library can best support the achieving of key institutional objectives such as enhancing the student experience, widening participation, delivering the curriculum, creating innovative learning and teaching approaches or enhancing the institution's research activities

2 Identifying the future library model

Understanding the vision for the future library within the context of broader campus development plans and digital strategy. Five models are described in this report:

- Library as **'Island'** – library as a distinct, identifiable facility housing all library functions.
- Library as **'Hub'** – library as part of a collection of student facilities designed to enhance the overall student experience, located together to create a vibrant heart to the campus.

- Library as **'Network'** – library extending beyond the central building, permeating the campus with library-managed and curated study spaces in Faculty and amenity buildings.
- Library as **'Clinic'** – library as the place to access information expertise and resources with study spaces provided by others across the campus.
- Library as **'Metaverse'** – library experiences and resources primarily digital via the library web services, AI, virtual and augmented reality. The library is everywhere.

3 Establishing the functional brief for the future library

Describing, in detail, the goals of the planned proposed project in terms of the vision and aspirations of the library in question, the activities that will take place in the library, and the spaces required to support those activities.

4 Identifying the physical opportunities and constraints impacting the future library

Assessing the building's current condition and the potential for re-use. If a new library building is being considered this will involve an assessment of the potential site for a new library building, including the possible capacity of the site and massing within the context of the university's campus masterplan, estates strategy and campus development plan.

5 Establishing the conceptual plan: matching demand and supply

Bringing together the functional brief that describes the user requirements for the future library with the proposed outline strategy for the re-development of the existing building or construction of a new building to define the future library project. This will used to inform further design development, the development of a project implementation strategy and an assessment of project costs.

1.

Introduction

The academic library is at a critical point in its evolution.

Without books, what is a library? When informal study spaces are appearing in every department across the campus, what is the library's role in providing space for study? When knowledge is available digitally and accessed through the internet or AI, what is the role of the library in the distribution and access of knowledge? In a post-COVID world what role can the library play in the campus culture and delivering the strategic vision of the University? Are radically different models of the future library now possible, if not likely, in the future?

These questions, and more, led to our study of the future of the academic library. The study involved interviews with senior leaders of 32 university libraries in Canada, Hawai'i, United Kingdom, Europe, Australia, and New Zealand.

Most of the libraries consulted were in the process of reviewing their strategy or were planning changes to their facilities. While there are many possible drivers for change, those which appear to be impacting university libraries most are:

- Changes in student enrolments (growth/ reduction) and increasing competition for students resulting in an increased focus on the student experience,

- Declining attendance on campus and a corresponding decline in retention rates, resulting in an increased focus on student welfare and support for academic success.

- Shifting societal expectations, a changing student demographic and a widening focus on inclusion, equity and First Nations.

- Pedagogical change including blended courses, block course and on-line lectures, resulting in changes in utilisation pattern and the types of student study spaces required.

- Declining use of the physical collection leading to the 'right-sizing' of collections and increased reliance on off-site storage.

- New technological advances and the growth of digitally accessible knowledge changing the way students and researchers interact with the library.

- A desire for improved research outcomes through increased Interdisciplinary research and engagement with industry.

- The evolution and growth of AI and digital scholarship creating new opportunities and challenges.

- Environmental sustainability and climate change and the role of the library in both reducing its own environmental impact and influencing change across the university.

- Tightening budgets and a corresponding drive for efficiency.

The library is widely recognised as an essential piece of infrastructure in every university. However, its potential to support a university to achieve its strategic goals appears to be underestimated by many institutions. With the right vision and development strategy the library can play a pivotal role in relation to the improvement of research outcomes, student experience, welfare and learning outcomes as well as supporting the advancement of digital scholarship, AI and interdisciplinary research.

The discussions with the library leadership teams were semi-structured with broad discussion topics covering:

- General description of library provision and library organisation structure at the university

- Future of general and special collections

- Library support of learning, teaching, and research

- Student experience and well-being

- Digital scholarship activities and ambitions

- Cultural and community inclusivity

- Library as workplace

- Changing library staff skills requirements

- Library contribution to university sustainability strategies

- Future library challenges.

The discussions were supported by a review of available university and library strategy documents and websites for each university.

Study participants

New Zealand

Lincoln University | Te Whare Wānaka o Aoraki

Massey University | Te Kunenga ki Pūrehuroa

University of Canterbury | Te Whare Wānanga o Waitaha

University of Otago | Ōtākou Whakaihu Waka

University of Waikato | Te Whare Wānanga o Waikato

University of Auckland | Waipapa Taumata Rau

Australia

Curtin University

Deakin University

Flinders University

Griffith University

Monash University

RMIT University

Southern Cross University

University of Adelaide

University of Canberra

University of Melbourne

University of New South Wales

University of Notre Dame Australia

University of South Australia

University of the Sunshine Coast

University of Sydney

University of Tasmania

University of Technology Sydney

University of Wollongong

Other Countries

Chinese University of Hong Kong

Delft University of Technology, The Netherlands

Simon Fraser University, Canada

University of Bristol, United Kingdom

University of British Columbia, Canada

University of Cambridge, United Kingdom

University of Hawai'i, United States of America

2.

Findings from the Future Libraries Study.

2.1

Enhancing the library experience to maximise student success.

2.1.1 Creating Connections and Community

The library is a key player in delivering many of a university's key strategic objectives – particularly around student success, enriching the student experience, supporting diversity, engaging with the community and enhancing research and innovation. This is achieved by ensuring that all students feel comfortable, welcome, and safe and through the provision of study and social spaces that allow them to work in the way that meets their needs and have a sense of belonging. Without this sense of belonging students are less likely to stay enrolled or be engaged. As Flinders University stated during the discussion:

"The library is at the heart of technology and social change on campus and is a key part of attracting and retaining students. The library is not just an overhead or cost to the university."

Southern Cross University noted that the library is the one space on campus that is always accessible. Access to other university spaces such as classrooms or laboratories is more tightly controlled. There are limited spaces where students can go of their own volition where they feel safe, motivated, and welcome – all these things will help the students to achieve what they want to achieve and are triggers to help them to succeed.

Griffith University recognizes that the library delivers more than traditional resources, services and skills to students and staff. It is a student community hub and a place for knowledge sharing and collaboration across disciplines, providing safe and welcoming spaces (both physical and digital) which encourage reflection, research, and innovative thinking. As such, the library services and activities are interwoven into all aspects of the university's business and provide important touchpoints across the student journey.

The goal of many of the libraries in this study is to ensure that this feeling of connection and community is achieved through both the physical and online digital library experiences since many students may not be campus-based or who choose not to enter the physical library buildings. A key element of this is how the student can interact with staff to access the resources and learning and research support that they need.

At the University of Canterbury | Te Whare Wānanga o Waitaha there has been a shift from thinking about the library as a repository of books to being a 'repository of people'. The Library provides a wide range of services to support student success including research and information management expertise, study and information skills classes plus one-on-one support, both face-to-face and on-line.

At the start of the academic year there is an enhanced level of service provision with library staff coming out from behind the service desk to actively welcome students, answer students' queries and direct them to the right place or person for what they need.

The provision of spaces that are supported by library staff is important to many students who may be new to university life. Staff provide some level of boundary and guidance that can make them feel more secure. The access to the library staff and the skills and support they provide is one of the reasons why the libraries are generally more heavily used than some of the unsupervised study spaces around the University of Canterbury campus.

The University of Canberra provides both on-line, and in-person, peer-to-peer support for library and study skills development. The Learning Hub on the entrance level provides centralized academic support services in the library with a concierge directing students to the appropriate breakout rooms for their support needs. The library uses their Virtual Learning Environment's (Blackboard) virtual collaboration rooms to provide equivalent on-line student support. A concierge directs students to appropriate virtual breakout rooms for their support needs and if more than one student is in the online concierge room, they are moved to a waiting room until the concierge is free.

A referral is needed to access library study skills appointments, which allows appointments to be reserved for students with more complex academic or equity support needs. The drop-in model has been successful for the library with approximately 13,000 engagements per year.

Several of the libraries provided general learning support services as well as library skills development. At Waipapa Taumata Rau | University of Auckland, for example, the library's functions have expanded to encompass Student Learning Services, Career Development and Employability Services plus Research Outputs, Systems and Support.

"The mission of the combined Te Tumu Herenga | Libraries and Learning Services is to "enable students to flourish by providing excellent opportunities, environments, services, resources, tools and expertise for learning, teaching and research."[1]

The library is a key delivery partner for the Student Services strategy and Te Tumu Herenga | Libraries and Learning Services and Student Services both report into the dVC Operations who is responsible for student experience.

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1 Waipapa Taumatu Rau | University of Auckland (2021), p.2

The collocation of student services, student study spaces and the library is common – bringing everything the students need to one easy to access location. Flinders University and the University of Adelaide have student study spaces and service hubs adjacent to the main library. The University of New South Wales is considering the re-design of its library entrance area to provide access to a range of student services such as student success, the Learning Hub and IT but they stressed that this would be a collocation of services rather than a merger.

At the University of Sydney, the learning hub is not part of the library but many support services, such as IT and student advisory support, are collocated with the library. The level of provision of these services in the library scales up and down depending on the student need at that time, with a higher level of provision at the start of the academic year.

The new University of Technology Sydney Library occupies several floors of UTS Central Building that also includes the Faculty of Law, food courts, study areas and classrooms.

Massey University | Te Kunenga ki Pūrehuroa, on the other hand, stressed the fact that students see libraries as places to get things done. The focus of the valuable library space should be on people, and on facilities and services which directly support learning and research (library, IT and learning support), rather than the provision of wider student services.

The libraries in the study all provided a range of study spaces and settings to support both individual and collaborative study by students. In 2014 the University of Tasmania published its decadal Library Future Vision to 2025 document[2], which stated that library spaces are destinations, places in which to think, collaborate, learn, discover, and create knowledge.

University libraries have a physical, virtual, and symbolic importance in an academic research institution. In response to the challenges and changes in higher education, the library's spaces, both in physical buildings and online, are evolving to be places which offer innovative environments that inspire and excite creative quality learning experiences.[3]

The Inveresk Library is set across three levels, it has modern learning facilities, extensive academic and cultural collections and places where people can study and connect. Members of the public can also sign up and borrow books from the library for free and visit the cafe on the ground floor. Staff from multiple teams on-site assist students in areas such as study information, digital and research literacies and academic skills. Artwork and cultural objects created by local artists, and from the University's cultural collections, are displayed throughout the building.

Caine Chennatt, Director Curatorial and Cultural Collections and Acting University Librarian, stated that the library, located at the heart of the Inveresk campus, served as a welcoming and inclusive front door to the University for the Launceston community.

Inveresk Library study area, University of Tasmania[4]

2 University of Tasmania Library (a)
3 University of Tasmania Library (a), p.3
4 University of Tasmania

University Of Wollongong Library study area[6]

"Inveresk library looks to an exciting future by evolving the traditional library concept in a way that ensures everyone can feel welcome and supported here….The space brings together students, staff, community and industry in a central, dynamic and inclusive learning destination which encourages the discovery of new knowledges, the exchange of ideas, innovation and in-person connections."[5]

One of the challenges that the libraries face is getting the provision of study seats right – both in terms of the overall number of seats but also the balance of individual and collaborative seats.

As well as the formal study seats there is increasing recognition of the need to provide a wider range of social and informal spaces and settings in the library to support the overall student library experience.

The Inveresk Library won the Australian Library Design Award for best Academic Library on 8th May 2024.

As several urban universities in both Australia and New Zealand noted, where student accommodation is expensive or cramped, students tend to 'live from the library' and may spend many hours in the library each day because it is a warm place to study with good availability of power and Wi-Fi. The University of New South Wales, for example, has found that students in shared accommodation are more likely to use the library.

To support students who 'live from the library', several of the libraries have created comfortable social spaces including kitchens, student lounges (described by the University of Wollongong as a 'space for refreshment and rejuvenation'), games and craft spaces, recreational reading collections, sleep pods and outdoor relaxation spaces.

RMIT noted that students are increasingly wanting the library to be something like an airline lounge – a place to work, eat and drink: a co-working space with available expertise in neutral territory.

Monash University stressed the library's role as a welcoming and safe space – as 'space for belonging' that is non-judgemental. For several years, the Library has been building its capability in human-centred design to create a culture that puts the user first. Staff across the library have undertaken UX research and design training and practice to improve their services and spaces. A LUX (Library User Experience) Squad can, when required, test furniture layouts, noise level zoning, or the online citing and reference guides. The aim is for co-designing experiences and spaces to be the norm and this will be the approach for the planned development of a sensory space for neurodivergent students.

5 University of Tasmania
6 Australian Library and Information Association

Southern Cross University

The physical library is part of a wider digital experience for most students. Some students may never come onto campus and do everything online and that is a valid student experience.

There are still some reasons for the physical library to exist and these are all about Collaboration, Connection and Contemplation. Some students need spaces for these activities to take place and this is part of having a sticky campus - creating spaces that students feel comfortable in whether this is a study space or a lounge.

**Southern Cross University Library study space[7]**

The Delft University of Technology (TU Delft) also stated that the library is where students can be themselves, be part of a learning community and acquire new insights. As part of the Netherlands' Stadium Generale programme, 'the Nook' space in the library is a shared space for critical thinking and discussion, providing opportunities for all students to debate ideas and develop their ethical positions. The events programme at the Nook includes debates, cinema nights, book clubs and political and philosophical discussions.[8]

While students are often able to make the best use of whatever spaces are available to them for study or social activities, many of the libraries in the study are working closely with students to ensure that the library provides the students with the spaces, services and experiences that will best support what they are trying to undertake in the library.

Flinders University, for example, works closely with the student library assistants to gain insights into how the library spaces and services are performing and the University of Waikato | Te Whare Wānanga o Waikato has provided user experience (UX) training to staff across the library to enable co-design of library spaces and services.

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7 Southern Cross University (a)
8 Delft University of Technology Library (a)
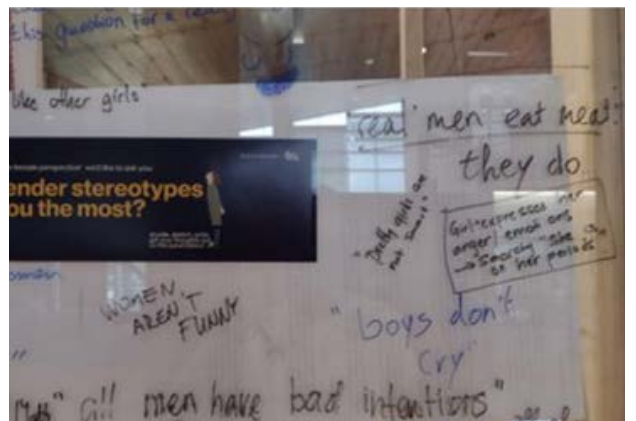
The Nook at the Delft University of Technology Library[9]

The insights gained from this work is combined with behaviour and data analytics to better understand how the library fits into the user journey and supports the creation of a 'sticky campus.'

The University of Adelaide has formalized the engagement with students by creating posts for student experience testers. Two students – undergraduate and postgraduate spend one shift per week testing how well spaces, services, web sites, and library apps work.

Given that students may have widely different views on what constitutes a comfortable and effective study or social space in the library – and that these preferences may change over the academic year – the other approach is to provide a range of different study space types and allow the students to select the spaces that meet their needs at that time.

The University of British Columbia Library, for example, has 15 branches across campus and each of these libraries varies in terms of their character and the blend of study spaces provided.

Improving the student experience is also the focus of the regular meetings of the Delft University of Technology Library Hospitality team. This includes the library hosts, the events team, facilities management, security, cleaning, and the IT desk.

9 Delft University of Technology (a)

2.1.2 Enhancing student well-being and health

Considering the well-being and health of the students is also a vital part of creating the best possible student experience. While this may involve the creation of inclusive, welcoming, and safe spaces for First Nations, neuro-diverse or LGBTQ+ students it is generally about supporting students throughout their academic journey and ensuring that activities and resources are in place to help students feel connected and able to seek additional help if they need it.

The University of British Columbia Library partners with the University's Wellness Centre to support student well-being. Library staff take on a pastoral role for students who aren't part of a community and need to find people to talk to.

Monash University Library has also rethought its after-hours staffing to focus on student well-being. The library will be staffed by people who bring a range of lived and living experiences and will be trained to support connection and inclusion, including mental health training, making better friends, and LGBTQ+ and disability allyship. Some will be Monash students offering peer perspectives and gaining valuable employment. These library experience assistants will spend more time engaging with students in the library rather than shelving books.

Delft University of Technology Library noted that, as a science university, many of their students are introverted and would rather stay at home and study on-line. The University wants to have direct contact with students and the library is a good place for this to happen. To encourage students to spend time in the library a range of recreational activities take place there and a coffee cart in the library provides food for students. A student living room contains a microwave and oven for students and pizzas can be ordered to be delivered to the library front desk.

Free food and coffee for students during exam periods is provided by several of the libraries in the study along with a wide range of de-stressing activities. Monash University Library, for example, runs 'Mindful May' with University partners and activities include chair yoga, origami, colouring-in and sessions with therapy dogs and the University of Adelaide's pastoral activities include the 'Unwind your Mind' programme along with free coffee and food. Similarly, Lincoln University Library has a leisure reading space that includes books, jigsaws, games, bean bags etc. and the library works with the Wellness team to run events in the library.

In 2023, as well as bringing dogs into the library during exam periods, the Chinese University of Hong Kong Library brought an Buddhist Abbot over from Australia to run a well-attended event called 'Ready, RESET, Go: Mental Training' that discussed how to respond to the uncertainties of life with a positive mindset.[10]

Delft University of Technology: Norah de knufelhond (Norah the cuddle dog)

The dog comes into the Library at exam time to help students take a break and recharge from stress.

"Norah is hypoallergic, fluffy and loves to cuddle! There are time-slots available to ensure that Norah can give you undivided attention. There also will be time scheduled to take selfies and pictures. Make sure to claim your cuddle spot and sign up at the Library desk! You can bring one fellow student." [11]

Students at the small campus in the Hague brought a toy alpaca into the student area for a small course group. The number of toy alpacas on campus grew and the students now produce an Alpaca newsletter.

The Student Council asked if this could be brought back onto the main campus so the library has sent photographs of Norah to a toy maker who will produce a number of toy Norahs that will be placed around the library for the students to interact with.

10 Chinese University of Hong Kong Library (a)
11 Delft University of Technology (b)

Colouring-in as 'Mindful May' activity. Monash University Library. Photo credit: Monash University Library

2.1.3 Supporting equity of access

Widening participation is a key priority for all the universities in the study including the support of 'First in Family', non-traditional students or students with disabilities. The University of Canberra, for example notes that around 40% of their students are 'first in family'[12] and 10% identify as students with a disability. Of the 10% of students who identify as disabled, around 70% of these are students with mental health conditions.

Similarly, the University of Cambridge notes that around 20% of its undergraduate students identify as disabled. To support these students, the library's Accessibility Service provides students with alternative ways of accessing library resources including assistive technologies, creating electronic versions of books in the library, modification of digital texts to ensure that they are machine readable by assistive technologies and the scanning of materials to make the text more accessible, overcoming problems such as illegible fonts and marginalia in the texts.

While the University of Cambridge Library's accessibility services strives to support the 4000 students who would benefit from their services, they face an additional level of challenge with the physical access to some of the University's 100+ historic libraries.

Spaces to support students with disabilities in the libraries in this study included dedicated study spaces and assistive technologies rooms. These rooms typically contain a range of technologies to assist individuals with disabilities related to vision, hearing, learning, or mobility. Several of the libraries in the study were repurposing these rooms as they are no longer needed since the required functionality is either built into the core software package or can easily be added. The University of Technology, Sydney, for example, is exploring possible conversion of some assistive technologies rooms into sensory spaces to better support students who identify as neurodiverse.

The provision of spaces to support students who identify as neurodiverse varied widely across the universities in this study, ranging from no specific provision in the library to adapting to designating existing spaces as spaces to support neurodiverse students and through to the creation of dedicated sensory spaces for neurodiverse students.

RMIT provides neurodiverse study spaces and runs study sessions in these spaces which have adjustable lighting and sound attenuation. Discussions with neurodiverse students found that the biggest issue for the students using the library was the effect of the air conditioning noise. The library also noted that there may be a tension with these spaces between too much visibility – which may be distracting – and safety concerns arising from the creation of the dedicated, private spaces.

12 University of Canberra (a) 2023

RMIT Swanston Library sensory friendly study spaces. Photo credit: RMIT Library

Flinders University Library Sensory Rooms

A pilot was conducted at Flinders University's Bedford Park, Flinders Medical Centre, and Sturt campuses where three dedicated sensory room pop-ups have been set up for students, staff and visitors. The pilot is being run by Flinders Neurodivergent Study Support and Advocacy (FNSSA) – a student club that was founded just over a year ago and already has more than 300 members and growing. The pilot was supported by the Flinders University Library, which identified and provided the rooms to FNSSA.

Sensory dysregulation is a common experience for neurodivergent students in traditional learning environments, leading to anything from mild discomfort and difficulty concentrating in class to panic attacks and meltdowns. This can be triggered by a particular event or prolonged exposure to low-grade sensory inputs such as having to navigate crowds, bright lights or higher/lower temperatures. For people that experience "sensory overload" having access to quiet and low-lit spaces provides a circuit breaker allowing them to recharge. For others, the opportunity to stimulate their senses using fidgets and other sensory tools allows them to decompress. Everything within the spaces is dynamic and adjustable to individual needs – there are multiple seating options, adjustable lights and blackout curtains, so individuals with a wide variety of sensory overload and sensory seeking needs can benefit.

"These sensory spaces are not only important in a practical sense; their presence signifies that neurodivergent students and staff are represented and welcome at Flinders University" says Chloe Walton, FNSSA Secretary and leader of the Sensory Space pilot.[13]

Flinders University Library sensory space[14]

13 Flinders University 2023 (a)
14 Flinders University 2023 (a)

Rather than creating dedicated spaces for students who identify as neurodiverse, several of the libraries in the study felt that students should not need to identify themselves as neurodiverse to access dedicated spaces. Instead, the library should include a range of spaces with levels of control over the environment including light, temperature and privacy that would be available for all library users.

Deakin University, for example, has opened 'reset rooms' in all its libraries as part of their Disability Access and Inclusion strategy. These rooms are private spaces that are designed to promote self-regulation. They are quiet spaces with film on the windows or curtains for privacy, with comfortable furniture, adjustable lighting and a duress button in case students require assistance. Booking screens outside rooms manage the use of the spaces – one-hour blocks of time – and the rooms are available for all students, but priority is given to the students who need them the most.

The University of Melbourne Library also includes several small, single person, low sensory impact spaces that are available for anyone to use. These are semi-permeable, private spaces with a light outside to indicate when the space is occupied and a camera inside the space to ensure student safety. As well as the provision of sensory spaces, an understanding of the needs of neurodiverse students has impacted the way that academic skills courses are structured.

Supporting students who identify as neurodiverse, the goal is to provide courses that deal with the symptoms – such as paying attention or maintaining focus – rather than addressing the overall condition.

Several of the libraries in the study were also working to provide spaces where parents could study alongside their children. The University of Canterbury library would like to make the library more 'Whanau friendly' by re-thinking some of the spaces on the floor where the School Educational Resources collection is housed to make it clear that this is a 'family friendly space.'

The University of the Sunshine Coast Library is creating a children's corner adjacent to group study rooms so that parents can bring their children into the library and still participate in group tasks. Most parent study spaces, they note, only provide spaces for individual study.

The Educational Resources collections can also be used by larger groups of children. Up to 30 children at a time from RMIT's childcare centre visit the library to use these books.

Summary

The library continues to be a critical element of the overall student experience with students seeing the library as a safe and welcoming place on campus – a home from home – that is more than just a study destination. Students in cramped or uncomfortable accommodation spend many hours in the library and the library spaces services, and events must support the students' study, social and welfare needs. The library provides students with a sense of belonging and without that sense of belonging, students are much less likely to stay enrolled or be engaged.

Key Findings:

1. Recognition of changing student demographics and varied expectations about what make a good library experience for students.

2. Libraries are striving to become more welcoming and accessible to diverse communities, including an increasing number of non-traditional students with specific needs.

3. Growing importance of user experience research and improved feedback loops to better understand and improve the experience provided.

4. Re-thinking the design of library entrance areas and service points – replacing imposing reception desks with more welcoming information and service points that are less intimidating to students and the wider community.

5. Increasing focus on making layouts more permeable and legible layouts to make them more accessible to visitors.

6. Increased emphasis on student safety, including improvement in sightlines and the reduction in stack heights, increasing the number of staff through the use of student helpers and increased security in evenings.

7. An increasing use of digital and online tools to improve engagement with students – on and off campus.

8. A greater focus on wellness and the user experience through organised activities and person-to-person interactions.

9. Reducing need for dedicated assistive technologies spaces as software is available as part of general software or as apps – avoiding need for students identify themselves as neurodiverse.

10. Provision of quiet and low-lit "low sensory" spaces for anyone who experience "sensory overload" – can be achieved through provision of spaces with levels of control over the environment including light, temperature and privacy that would be available for all library users.

11. Co-location of a variety of student services with the library to provide a one-stop-shop for student support – sharing of valuable 'real estate' and high levels of student footfall.

12. Adjacency with other student focussed functions such as food and beverage, retail, students' union and teaching hubs to create a campus hub.

13. Increasing support for students with families through the provision of spaces and children-friendly zones where parents can study alongside their children, either alone or in group study settings.

2.2

Managing the collections.

The size and role of collections varies across the libraries in the study according to the age, size and focus of university and the legal status of the library, with two of the libraries in the study being legal deposit libraries.

All libraries in the study reported that a very high percentage of current library collections expenditure was allocated to the maintenance or acquisition of digital resources such as e-books or e-journals.

It was noted by Flinders University that the size of the collection has traditionally been important for the support of the university's research activities. However, e-books and e-journals have levelled the playing field - Flinders students can have access to the same digital research collection as Harvard.

The use of the physical book and journal collection by students has reduced dramatically with several libraries in the study reporting that students typically taking out less than one book per year. Consequently, almost all the libraries are engaged in actively reviewing and reducing their physical collections (50% reduction target was common) to create more space for additional study seats or other facilities. Low use items are either stored in on-site Automatic Book Retrieval Systems, in campus stores or offsite in owned or shared stores.

Alongside reviews of the frequency of use of items in the physical collections many of the libraries are engaged in ongoing programmes of work around the decolonisation of the collections This can include a review of the content of the collection, the meta data and descriptions associated with it and the accessibility and use of cultural materials.

2.2.1 Growing the general collections

While the focus of collections development in most of the libraries in the study is on the acquisition and management of digital resources, there is still room for the acquisition of books and journals by the libraries for the general collections as well as adding items and collections to their Special Collections. Some subject areas such as Fine Art are best served by printed materials and cultural collections may not be available in digital form.

The University of Cambridge is actively filling in gaps in its modern collection and diversifying it to reflect the changing curriculum and student activism. Other libraries were focused on adding books related to the history of their core academic disciplines, the history and culture of their First Nations communities or related to the area in which the university is located.

University libraries in various parts of the world have expanded their collection's scope into non-traditional areas – creating so-called 'Library of things', providing students with access to items they may not normally have access to. While many of the libraries in the study made items such as laptop computers and computer peripherals available for student use or had games and puzzles available to support student well-being and relaxation there were few examples of libraries wanting to formalise this offer. The RMIT Library, however, is considering the option of creating a Materials Library to support the university arts and design curriculum.

The University of Cambridge

The University of Cambridge Library's web page on Diversifying Collections and Practices, for example, acknowledges that the library is a contested not a neutral space and that the library service has a responsibility to "acknowledge and play our part in addressing the interconnected issues of racial inequality, intolerance and historically entrenched racism."[15] Cambridge University Library is home to more than nine million books, manuscripts, maps and other objects, collected over 600 years. In addition, they are also home to tens of millions of electronic items, and a Digital Library of over 50,000 openly accessible versions of our historic special collections.

Dr Jessica Gardner, University Librarian and Director of Library Services at the University of Cambridge (2020) recognised that some of their collections were previously owned or donated by or acquired with the help of those whose wealth was associated with the Atlantic slave trade and many of their collections reflect the history of British colonialism, and its impact on communities round the world. There is a programme of work across Cambridge University Libraries to research, understand and address this legacy, including the historic assumptions, narratives, and language use around some of their collections.

The library aims to ensure more inclusive recruitment and services, and to adapt their collecting practice, collection descriptions, public programmes and the information published on our website. To support this work, they have convened the Libraries Decolonisation Working Group to help formulate guidance and policy for the decolonisation strategy and the library will also work closely with Decolonising through Critical Librarianship, an existing grass-roots organisation for Cambridge Librarians.[16]

15 University of Cambridge (a)
16 University of Cambridge (a)

2.2.2 Collection space in the library

Despite the reduction in the number of books being checked out, many of the libraries in the study stressed how much the students value the presence of the collection. As the University of Canterbury stated – the presence of the physical collection plays a powerful role in reinforcing the centrality of the library and its role as both the heart of the campus and the technical and intellectual hub of the university and provides a strong identity of the library as a place to go and learn.

Libraries did vary widely in terms of the proportion of the collection left on the library floors, where it was located and how it was used.

The University of South Australia has reduced most of their print assets across all collections, apart from the Special Collections held at various campuses and at the Bob Hawke Prime Ministerial Library. There are also physical items held at an off-site storage facility that are available on request. The areas formerly occupied by the book stacks in the Jeffrey Smart Building have been converted into a range of study spaces for both individual and collaborative study.

Two of the libraries in the study moved their physical collections into on-floor compact shelving. Following a major refurbishment project, the collection at Curtin University's TL Robertson Library is housed in the library's existing electronic compact shelving on Level 2 behind glass walls. Books on the compact shelving are available to students via a 'click and collect' service. There are plans for the stacks to be open by appointment for faculty and postgraduate students after they have gone through an induction process about using the electronic shelving.

The library believes that the visibility of books within the library is still important, and this is achieved through the creation of 'Read and Return' recreational reading collections that are in the library. These books are not catalogued – they just have a label on them saying 'Read and return.' – and it is hoped that people will return the books at some point.

Following the refurbishment of the library, the physical collection will be concentrated onto manual compact shelving behind a glass wall at Notre Dame University Australia. This shelving will be visible from the main part of the library to reinforce the fact the building is still a library and that it contains the heritage of the university within it. Staff will retrieve items from the stacks for students and students will also be able to access the stacks by appointment. The separation of the stacks from the main library spaces will enable the removal of the security line from the front of the library so that the main library spaces will be easily accessible to everyone.

The University of British Columbia has an Automated Storage Retrieval System (ASRS) attached to the Irving K. Barber Learning Centre. The ASRS was opened in 2005 and has a capacity of 1.8 million volumes. Their ASRS has experienced several technical issues in recent years as COVID impacted the maintenance of the system and the availability of parts, with the library having to obtain any inaccessible ASRS material via inter-library loan where it can.[17]

In 2015 this was supplemented by a new storage facility – Library Preservation and Archives (PARC) – a modular storage facility designed to accommodate the future growth of library collections. The 2,280sqm of high-density storage can store around 1.6 million volumes and the facility also houses a campus-wide records management service. PARC is currently around three quarters full, but the University can add a second storage module to accommodate future growth in the collections. While there has been some weeding of the collections in recent years the library generally retains all the books it has purchased.

The University of Technology Sydney Library has an LRS (Library Retrieval System) located under the Alumni Green, next to the main library in the UTS Central building. The relocation of 80% of the library's collection into the LRS was completed in 2019 as part of the move to the new library in UTS Central, allowing more space in the new library to be devoted to creating a range of collaborative and individual study zones.

Since the opening of the new library the library has changed its purchasing strategy to 95% digital learning resources and requests for access to material in the LRS are decreasing as a result. The library leadership team are considering how the LRS could be better used to create value for their clients. One option being considered is moving high use materials into the LRS so that students could access them using a 'click and collect' service and exploring what a modern reference Library space could be in a University of Technology.

The University of Adelaide has an ongoing programme to review their collection of more than 1.5 million items to ensure that the items that are needed to support learning and teaching remain on site with the rest being sent to an external store or de-accessioned. The reduction in the physical collection has enabled the phased refurbishment of the main library. It has been possible to reduce the shelving height which has both improved student safety and the natural light levels and to create a range of new study areas within the library to meet the student request for additional quiet study seats.

In 2018 the library created several neighbourhood collections with materials that had previously been housed in different sections of the library being brought together to make access to these materials easier and encourage discovery.

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17 University of British Columbia Library (a)

Japanese Collection and study space, Barr Smith Library, University of Adelaide[18]

The initial neighbourhood spaces – including the specialist collections and associated reader spaces – were Music, the East Asian collection, Pride, Yaitya Ngutupira and recreational reading collections. More recently the use of these neighbourhoods has been reviewed with some parts of them being reintegrated with the main collection. Music, East Asian non-English language materials, Yaitya Ngutupira and the recreational reading spaces remain. The recreational reading neighbourhood contains fiction and non-academic non-fiction books and includes places for students and staff to relax and sleep. The intention is for sleep pods to be installed in this space.

Several of the other libraries have also collocated their First Nations collections to create dedicated spaces to create culturally safe spaces on campus to support First Nations students and manage responsible access to culturally sensitive materials by students, faculty, and the wider community.

The Delft University of Technology has most of its physical collection located on its iconic 'book wall'. Completed in 1997, the library's East wall is covered by suspended steel-frame bookcases rising four floors and accessible via stairs. The number of books stored on the wall has been reduced from 80,000 down to 40,000 and work

is underway to make the book wall more interactive and digital – including screens within the bookshelves that may display images of book spines that can then be accessed via the screen with links to papers and citations etc. Linked to student ID cards in the future, the screens may also display personalized material based on knowledge of student courses and preferences.

The University of Tasmania is also re-thinking the use of its collections. Their goal is not to radically reduce the collection, but they do want to use it differently. While the intention is to reduce the collection over time to create additional study spaces, they also want to change what these spaces will be and how they will function. The library has taken over the management of the University's cultural and art collections and the goal is to create display space in the library to exhibit these collections and interweave the library's digital collections with physical books and the cultural collection objects. This will enhance opportunities to use the cultural collections for object-based learning for schools engagement and tertiary education and reinforce the fact that these collections are not just decorative – they are there to support learning, teaching, and research. The library acknowledges that the development and curation of these hybrid physical and digital library experiences will require additional in-house digital skills.

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18 University of Adelaide (a)

Delft University of Technology Library 'book wall'[19]

The book stacks that remain in the library also have other useful functions in terms of defining zones of space within the library and providing a level of acoustics separation between these zones. When the University of Wollongong remodelled their library, they used their reduced collection to create several study spaces in the library – 'cocooning the spaces', using the books' acoustic properties to create quiet spaces but also encouraging serendipitous discovery in the book collection.

When considering the conversion of library stack space on several floors to study space, the University of Canterbury realised that it would be necessary to ensure that the increased occupancies of these floors remain within the maximum occupancy levels permitted in the building's fire and evacuation strategy. Additional escape stairs may be required for the increased population and the provision of toilets on these floors may also need to be increased to accommodate the increased population who are likely to be occupying the study spaces for extended periods.

2.2.3 Off-site stores

Many of the libraries also stored low use or archive materials on off-site stores. There are significant costs associated with constructing and operating remote stores and several of the universities in the study are reviewing opportunities for the creation of shared stores, or for creating shared print solutions that may reduce the number of volumes that need to be stored.

Logistical problems make the sharing of library off-site stores difficult for universities that are not located close to one another, and other problems arise if a university decides to locate its remote store on less expensive land away from its campuses.

The University of Wollongong consolidated its book collections during renovations to create additional study spaces and lower the heights of the stacks to improve natural light and visibility within the library. The plan is to do the same to the journal collections when the next phase of the library refurbishment. The library initially moved about one third of its book collection to offsite storage but they are currently in the process of decommissioning this facility. Any books that have been requested during the last five years will be brought back into the onsite collection and the rest will be deaccessioned and disposed of.

The libraries in the study with legal deposit functions do need to find solutions for housing their continuously growing collections. The University of Cambridge is one of six legal deposit libraries under UK law, and, through this, the library receives about 100,000 new items each year (800-1200 books per week). Uniquely, the library makes much of this material available on open access and some categories of readers can borrow from it.

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19 Mecanoo

University of Cambridge Library Ely storage facility[20]

To house low-use materials from the University Libraries, including the University Library and Faculty and Departmental Libraries, the University of Cambridge has constructed a large storage facility in Ely (2018) which contains more than 100 kilometers of shelving, able to accommodate up to 4 million volumes, making it one of the largest library storage buildings in the world. At current estimates the building is not expected to be full until 2030 at the earliest and the site and building has the space and infrastructure to allow a further 25% expansion.[21]

At the time of the opening of the storage facility Dr Jessica Gardner, Cambridge University Librarian stated that

"….to make sure we can continue to preserve what is so precious – and meet our ambitions to be a truly global, 21st century collection – we have to make the most effective use of space possible. The off-site storage helps to ensure that the most appropriate printed material is kept in the most appropriate and useful location for all our readers. At the moment, material which should and could be on open shelves at the UL is in our closed collections.

Our new Ely site will support teaching, learning and research across all of Cambridge's amazing libraries by allowing us all to plan new spaces and rethink our existing facilities and services. Only very low-use material will be considered for ingest for which there is little expected future demand."[22]

The goal at the University of Cambridge is to reach a new balance of storage and people spaces in the libraries by using the opportunities of offsite storage, digital growth, and collections as services to create spaces for the new sorts of functions that their users now want. However, given the vast scale and tradition of the collections at the University Library site, the collection as place continues to have resonance.

20 University of Cambridge
21 Roberts (2018)
22 University of Cambridge (b)

Summary

The increasing importance of the library's digital collections to support learning, teaching and research has enabled the significant reduction in the amount of space occupied in the library by the physical book and journal collection. This, in turn, has created valuable space in which a whole range of spaces and amenities can be created to enhance the student experience and provide spaces to support learning and teaching, be it the provision of additional individual study seats, collaborative work areas or more specialist spaces to support the development of First Nations study spaces, media production or digital scholarship centres.

This provides the library with an opportunity to evolve within the existing building(s), in a phased way as each stage of the collection reduction occurs.

It is critical, however, that there is an overarching library space strategy that aligns with the wider university study space and learning, teaching and research strategies to ensure that the best possible blend of spaces is created to support the current and future needs of the institution and the students.

Key Findings:

1. Declining use of the physical collection in most of the libraries and the corresponding 'right-sizing' of collections – disposal or removal to off-site storage of low-use items.

2. Desire to free up stack space to create student study or other library facilities.

3. Recognition that students still value being around books when they study so the physical collection (albeit reduced in size) remains to deliver the library 'feel'.

4. Use of remaining physical collection to define study zones and create acoustic separation.

5. Creation of subject matter neighbourhoods to make the physical collection more accessible and support special interest groups.

6. Growth of Indigenous collections and collections specific to specialisms in the University.

7. Focus on Decolonisation of collections and greater cultural sensitivity in relation to how collections are displays and accessed.

8. Interest in the creation of non-traditional collections to support learning and student well-being - a "Library of Things" including loan computers, computer peripherals, camera equipment, camping and sports equipment.

9. Increasing reliance on offsite storage solutions (or compact shelving solutions) with "click and collect" access by students.

2.3

Celebrating the importance of Special Collections.

A library's Special Collections may include diverse institutional treasures including rare books, historical and university archives, and ephemera. They may also include non-paper-based items including the university art collections and materials related to the history and curriculum of the institution. Lincoln University | Te Whare Wānaka o Aoraki's Special Collections, for example, include the 300+ works in the University Art Collection, wool samples, botanical specimens and soil samples and the University of the Sunshine Coast has an herbarium containing 10,000 plant specimens housed in a purpose-built room in the library as well. The University of Sydney Library has a print room featuring two heritage printing presses. A Printer-in-Residence program is offered annually to produce new creative outputs and a range of activities for students and the community take place in the print room.

Many of the libraries in the study were exploring ways to give increased prominence to their special collections and rare books, given that these items are increasingly the Unique Selling Point of the library as the general collection becomes more digital.

The University of Waikato noted that the wider USP of the Library is all about storytelling and they aim to make the Special Collections more accessible to support this.

The Library holds a number of taonga (treasures) and is home to Mātangireia: the University's collection of Māori, Pacific, Aotearoa and Indigenous resources, including O Neherā - the University's digital library showcasing their digital and digitised collections. The library has created several new Māori and Pacific roles, including roles working with the Special Collections and taonga the library holds.

As part of library refurbishment projects, the Special Collections spaces and the associated Reading Rooms are being relocated to more prominent locations within the library. The Reading Room is being enhanced to include exhibition and display spaces, teaching, and research spaces to support object-based learning as well as digital scholarship activities such as digitisation, and visualisation. The storage of the Special Collections is also being improved to ensure the best environmental conditions for the preservation of the fragile materials.

Consideration is also being given to what items in the Collections should still be in the library buildings and what would better be located elsewhere – on campus or externally – to make best use of the available space in the library. The University of the Sunshine Coast, for example, is exploring options for the location of its herbarium given that the one course that uses the material is being taught across multiple locations so access to the physical collection is now less relevant.
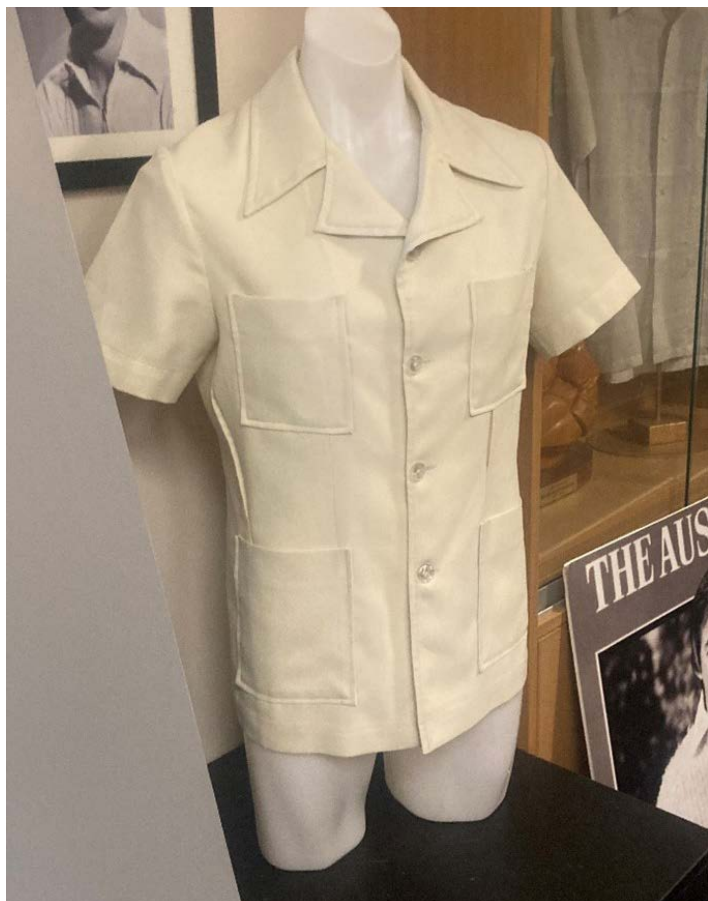
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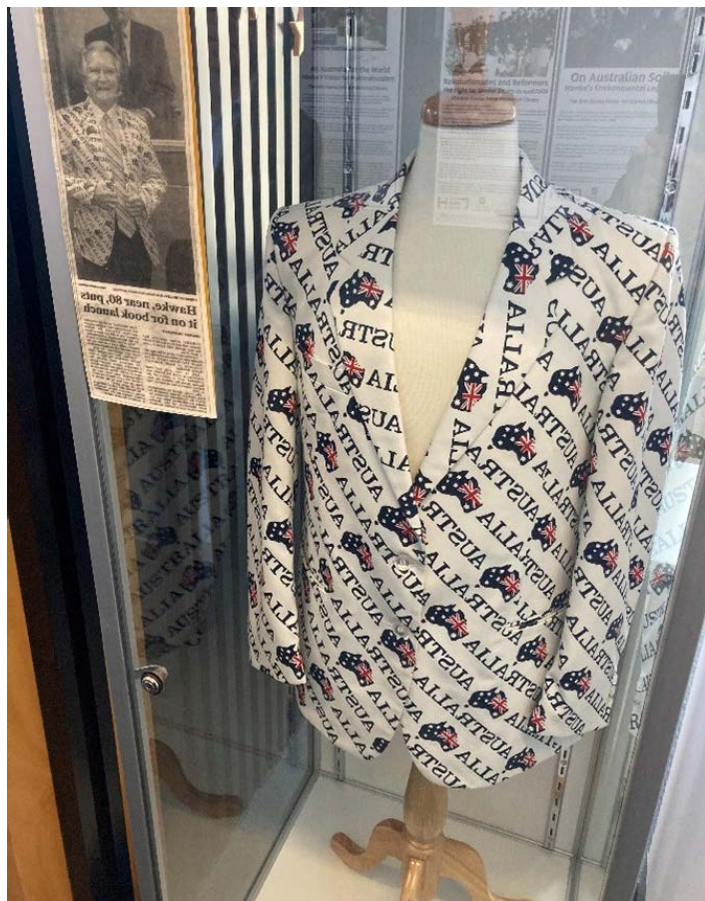
Bob Hawke jacket, Bob Hawke Prime Ministerial Library,
University of South Australia © Andrew Harrison

The University of the Sunshine Coast Library also houses the K'gari (Fraser Island) Archive which comprises historical, scientific, and political material including manuscripts, photographs, reports, and surveys. There is recognition by the library that this archive may also not be in the best location to enable easy access to the collection by the community that connects with the archive and who would want to use it for family history research. To support this use some of the material in the archive has been digitised but only at a high level.

Exhibition spaces within the libraries are being used widely to highlight items in the Special Collections and these also can provide opportunities to work with students to co-curate exhibitions as part of their course work or to reflect student activism and concerns. On-line exhibitions, as part of the library's digital collections web pages and social media, can also be used to highlight items from the Special Collections. RMIT, for example, uses social media to display early photographs of the history of the university to help students understand more about where they are studying.

The Special Collections at the Chinese University of Hong Kong Library includes Chinese rare books published from the Yuan dynasty (1271-1368) to the end of Qianlong reign period (1795) of the Qing dynasty, and Western rare books published before 1900.

Its collection of oracle bones is the largest of its kind in Hong Kong. A particular strength of the manuscripts collection is the works of Hong Kong writers and literati, as well as contemporary Chinese writers and poets.[23]

Many of these works have been brought together in the newly refurbished (2022) Hong Kong Literature Collection Area in the Library which includes open and closed stacks, exhibition and multimedia display space including a thematic wall that explores the history and development of Hong Kong literature, as well as study and discussion areas. The curved closed stacks combine glazed and secure bookshelves with display areas that contain writers' personal belongings and documents. Open stack areas contain the collection of works by contemporary Hong Kong authors.

Multi-media interactive kiosks located throughout the Literature Collection Area enable users to explore the Hong Kong Literature Archive, the Hong Kong Writers and Artists Biographical Database that shows the biographies and social networks of writers, and the Hong Kong early tabloid newspapers collection. The Hong Kong Literary Maps Virtual Reality programme developed by the Library also enables users to understand Hong Kong writers and literature from different perspectives – linking the works to historical and contemporary images of locations mentioned in the books.

Closed stacks, Hong Kong Literature Collections Area, the Chinese University of Hong Kong Library
Photo credit: The Chinese University of Hong Kong Library

23 Chinese University of Hong Kong Library (b)

Multi-media kiosks, VR applications and display areas, Hong Kong Literature Collections Area, the Chinese University of Hong Kong Library
Photo credit: The Chinese University of Hong Kong Library

The refurbished Sir Louis Matheson Library at Monash University's Clayton campus includes a new Special Collections Reading Room, Gallery and floor-to-ceiling display cases to improve access to special collections. The Gallery hosts exhibitions, functions, and special events to showcase and celebrate the special collections with the community. History and multimedia design students worked alongside library staff to bring to life special collections items exploring Repatriation in Melbourne after the First World War. This exhibition, 'Return; the way back home', included student-created immersive virtual reality experiences that enabled visitors to experience many dimensions of wartime life.

The development of spaces within the Special Collections area to support object-based learning was seen as another way of increasing engagement by students with the Special Collections. As part of the planned redevelopment of their library, Simon Fraser University intends to create a very visible Special Collections Centre and provide opportunities for all undergraduate students to engage with primary materials in this space. Digitisation programmes also make the Special Collections more accessible to the university and the wider community as well as create opportunities for digital scholarship and new forms of collection-based research and object-based learning.

Delft University of Technology is actively searching out Special Collections material and digitised collections from around the university and housing them in the Trésor (Special Collections Centre). This includes both historic material and University output that is not usually included in academic journals such as speeches, dissertations, and lecture notes.

The library works closely with the Faculties to explore how the heritage collections can be used in education through the creation of VR layers or the use of digitised material. Staff numbers in the library have increased to support these activities and each Faculty also has a Data Manager to help make the integration happen.

The University of Melbourne Library is encouraging the use of its collections to support learning and teaching and enhance the student experience. The library staff work with students on the co-creation of exhibitions using Special Collections items and students use the Special Collections Reading Room to do assessment presentations.

The library also operates a Virtual Reading Room service that facilitates access to items in the Special Collection items using high resolution imaging. This service emerged from work they had undertaken with the University of Edinburgh and was first offered during COVID when students were unable to access the material they needed. The library is also working with the University of Sydney on the development of low-bandwidth applications to access digitised materials that can be accessed by regional communities. This will support wider access to Indigenous materials and provide opportunities for collaboration with State or public libraries.

University of British Columbia: Shakespeare xR project

In 2022 the University of British Columbia acquired a 1623 Shakespeare First Folio – one of only two copies in Canada. One of the conditions attached to the purchase was that the public had to have access to the text. The first stage of this process was to release a digitised version of the Folio on UBC Open Collections which took over a year to complete and enabled the Folio to be accessible to researchers around the world and the wider public.

The Shakespeare xR project (2023) used the 2D digitised representation of the Folio as the starting point for an ambitious project to translate this into a 3D digital experience that "reimagines some of Shakespeare's characters taken from the First Folio across different technological media" such as web-based AR, AI and an interactive touch table. This table would enable the creation of a 2D environment so that users in the library will feel they are actually turning pages in the book.

Collaborating with UBC's Department of Theatre and Film, and the Emerging Media Lab at UBC, the library developed an ambitious digital media plan for the next phase of the project to support research into lesser known Shakespeare characters. The project included the creation and animation of characters for web-based AR, VR applications with motion captured characters speaking parts of the text, access to the 2D scanned pages and a 3D VR environment of the Globe Theatre.

The Shakespeare xR project web page states that the "target audiences are library goers and those unable to access the Shakespeare First Folio. It's also for those individuals who may not be into Shakespeare or experiencing Shakespeare though a live staging or film."[24]

UBC Library Shakespeare xR project: digitising the First Folio [25]

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24 University of British Columbia Emerging Media Lab
25 University of British Columbia Library (b)

The University of the Hawai'i at Manoa

The University has the largest collection of Hawai'i and Pacific material in the world with the Pacific collection being internationally recognised for its materials related to Melanesia, Micronesia, and Polynesia. The Archives and Manuscripts Unit also houses the Hawai'i War Records Depository and the Japanese American Veterans' Collection. The University Archives include material relating to the history of the university and state and local history documents.

In 2004 the ground floor of the Hamilton Library was flooded by the nearby Manoa stream causing around US$40 million of damage to the Library.[26] The government documents collection and maps collections were most affected with 95% of the 2 million items in the government collection destroyed along with 65% of the maps and aerial photographs. 36,000 items awaiting processing in Collection Services were also lost. Tens of thousands of mud-covered maps had to be cleaned by hand over several years and the collection was rebuilt over the following ten plus years.[27]

The Library continues to acquire items for its core Asia and Pacific collections across eight geographic areas. 90% of these acquisitions are still in print form as they are not available digitally.

The flood-damaged map collection on the ground floor of Hamilton Library in 2004[28]

26 University of Hawai'i (b)
27 Morris (2006)
28 University of Hawai'i (a)

University of Sydney Library Cultural Protocols

In 2022 the University of Sydney published a set of protocols[29] to ensure Aboriginal and Torres Strait Islander library users feel safe, respected, and valued. "The protocols are designed to address wide-ranging issues including access to culturally sacred and secret materials, racism and inaccuracies in historical materials, and representation of First Nations voices and perspectives."[30] The University web page announcing the protocols noted that their implementation is an ongoing process that will take several years and that the protocols will have an impact on every aspect of library operations, from collection development to the design of library spaces.

Regarding library spaces, the protocols note that the aim is to create a visible First Nations presence within Library spaces, to increase cultural safety and promote a greater sense of place and understanding of First Nations cultures. This includes extending the visual representation of Aboriginal and Torres Strait Islander language, art, and history within Library spaces in different mediums. These spaces should follow the Wingara Mura design principles, also developed by the University of Sydney, and the protocols suggest that thought should be given to whether any library spaces are too Western.

Things to consider include:

- An overabundance of colonial artworks or portraits of colonial figures

- Historical references which do not include any Aboriginal and Torres Strait Islander perspectives, and

- Messaging that dismisses First Nations history.

In line with the protocols, the Library has implemented two dedicated spaces for Aboriginal and Torres Strait Islander students. The spaces are used to meet friends, relax, and study with other students. Programmed activities and classes may include external members of the Aboriginal and Torres Strait Islander community.[31]

Aboriginal and Torres Strait Islander student space, Fisher Library, University of Sydney[32]

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29 University of Sydney Library (a)
30 University of Sydney (a)
31 University of Sydney Library (a) pp. 23-24
32 University of Sydney Library (e)

Many of the libraries in the study are continuing to add to their Special Collections either because of gifts or bequests or because of strategic acquisitions to support the mission of the library and the university. The University of Bristol, for example, is investing in new resources that take a decolonized perspective including the acquisition of archives and items from under-represented or previously marginalised communities. The library is reviewing terminology and meta data to ensure it is taking a non-colonial stance and that the provenance of all the items in the collections is understood and they provide guidance on decolonising to academics and students.

The Library is also part of the University's Reparative Futures programmes, which was launched following the removal of the Coulson Statue in Bristol, to open up the Library's archives and work in partnership with local communities to recontextualise and re-interpret narratives within the collections.

The University of New South Wales is developing its Special Collections by commissioning local Indigenous print material as well as acquiring materials with connections to research at the university and relevant archives.

As well as being visible and welcoming, the Special Collections area also need to provide appropriate environmental, security and culturally safe places for the use of the rare and culturally sensitive materials. The University of Cambridge library has an e-Deposit role as well as a legal deposit of physical materials.

There is a requirement for dedicated and controlled physical spaces in the library to support this role including a Safe Pod for registered users to access data sets in a safe and private space.

The University of Melbourne also stressed the need to consider the mental health impact on students/ staff/ visitors who may be accessing traumatic materials in the Special Collections. They have implemented policies to support people who are accessing these collections in appropriate spaces within the Reading Room.

There was considerable excitement across the libraries about the future of the Special Collections and the opportunities they can create for new research and understanding, particularly through the application of digital scholarship and artificial intelligence to the collections. The skills developed by the library team in these areas are of great value to the institution and to society. A recent article in the New York Times, for example, warned of the possibility of generative AI creating fake historical documents because much of the digitised material online has not been watermarked to make this more detectable.[33] It will be the skills developed in the libraries of the world that will prevent this from becoming a major problem – both through the preservation of the original source materials but also through the development of effective tools for the watermarking of the digitised collections.

33 Shapiro and Mattmann (2024)

Summary

As discussed elsewhere in this report, the development of the expertise needed to get the most out of the Special Collections will require the application of new skills sets and technologies within the library and new collaborations between the library, academic departments, and external partners. In the more immediate future, however, there are also significant gains to be had through giving the Special Collections more prominence in the library and making them more accessible and welcoming and an important part of the student library experience. As one of the interviewees for this study noted: students like the library experience and being around the books while they study – 'Doing library' was the phrase that was used by students. Nothing is more library than the Special Collections!

Key Findings:

1. Recognition of the importance of the Special Collections as the library's USP leading to a desire to give greater prominence and visibility to Special Collections within the library space

2. Special Collections Reading Rooms are being enhanced to make them more visible and usable.

3. Increased use of Special Collections in teaching. Spaces being provided within Special Collection areas for object-based learning combining digital tools with primary sources.

4. Digitisation programmes and high-resolution imaging of the Special Collections to make them accessible nationally or internationally.

5. Machine-readable digital Special Collections creating new research and learning opportunities, creating strong links between the Collections and campus-wide digital scholarship activities.

6. Libraries reviewing their Special Collections in core library spaces to ensure they are relevant to research and curriculum delivery – other collections being moved into stores.

7. Strategic growth of Special Collections in areas aligned with the Universities academic or social goals.

8. Increasingly stringent requirements for the environmental protection of Special Collections requiring capital investment in building improvements.

9. Centralisation of Special Collections from other parts of the campus (Faculty/Department) into the library.

2.4

Creating spaces to support learning and teaching innovation.

Learning and teaching approaches at universities has changed radically in recent years with a shift to more active, collaborative learning with students increasingly working together on projects, often involving the development of presentations, videos, performance, and the development of prototypes. Accelerated by COVID, the traditional lecture has become less common with the delivery of lecture content online and face-to-face time being used for 'higher learning value' tasks such as discussions, case study analysis or student seminars. Many classes are also held online, in part or completely, with students actively participating in seminars and other activities online.

2.4.1 Supporting university learning and teaching spaces

The role that the library plays in supporting learning and teaching across the university is illustrated by statements in Griffith University's Library's 'Strategic Directions 2021-25' document which states that by 2025:

"The Library will provide leadership in bridging pedagogy and technology initiatives across academic groups, campuses and organisational silos while also being deeply embedded in student success initiatives at the ground level…..The Library will be instrumental to the success of the digital agenda, being one of the key touchpoints through which students develop digital literacy and engage with digital technologies."[34]

Learning, Teaching and Library Services at Lincoln University also plays a major role in supporting learning and teaching across the university. The library runs the course reading list software and prepares all the required book chapters and journals papers including locating the texts in digital or physical collections, digitizing where necessary and managing clearances. The library also manages the lecture streaming software which captures and auto-captions most of the university's lectures. The learning and teaching advisors in the library also work with faculty to develop new online courses and support student success.

As learning and teaching approaches change at the university, the way the library is used by students is also likely to change. At the University of the Sunshine Coast, for example, in 2022 lectures in all courses were replaced with a mix of in-person seminars for students who wished to attend, supported by interactive on-line learning resources. Information literacy used to be embedded into the curriculum with library staff teaching sessions as part of the course. With the end of lectures the academics don't have time available to include library staff in the multiple tutorial sessions so the focus of information literacy development is now on the creation of embedded learning objects that can be accessed via the Virtual Learning Environment. The library study seats are now most heavily occupied on Mondays when there are no tutorials.

Southern Cross University has transitioned to a six-week block teaching model for all courses, designed around the creation of immersive and interactive learning experiences. There are six, six-week blocks with two week breaks between terms, with the final assignment of each unit being due on the Monday of Week 7. A full time students studies eight units per year over the four terms and each unit will consist of around three hours of active class-based learning and 20 hours of self-access online learning per week.[35]

The adoption of the block teaching model has changed the way students use the library in that library use is generally stable over the whole academic year – the library is used consistently from Day 1 of the block through to the Monday of Week 7. 24-hour access to the Gold Coast campus Library has recently been introduced. The Library is unstaffed after 5pm with access controlled by student swipe card and there are regular security patrols after hours.

The University of Tasmania also found that as the university places less emphasis on examinations, the peak uses of the library have reduced, and student numbers in the library are more consistent across the academic year.

Space use at the University of South Australia Library, on the other hand, is very variable during the academic year with it being empty at the start of the first term and crowded at exam time. The library is exploring options for using the under-utilised library at the start of the year for other community uses to make better use of the space.

COVID accelerated the development of the digital collections across all the libraries in the study as libraries rapidly transitioned to online delivery of services during the pandemic. As campuses re-opened and courses continued to be delivered as a mix of face-to-face and on-line activities, the number of students who came on to campus to visit the library has changed significantly in many of the universities in this study. Reductions in gate counts of 30-50% per annum were reported by several libraries, whereas other libraries have seen visitor numbers return to pre-COVID levels relatively quickly.

Griffith University Library physical space usage is at 50-80% compared to pre-COVID levels across the campus libraries. They have also found that the students who do visit the library tend to spend more time in the building, often watching lectures on-line, taking advantage of the warm and comfortable environment and high-quality Wi-Fi.

The reduction in visitor numbers can be positive in that it may enable the delivery of a better student experience. Deakin University, for example, notes that pre-COVID their libraries were jam-packed with students finding it difficult to always find a suitable study space. Now that visitor levels are consistently at 50% of pre-COVID, there is enough activity in the spaces to animate them and students can always find a study space.

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34 Griffith University (a), p.7
35 Southern Cross University (b)

Griffith University G11 Library Learning Commons study settings[36]
Photo credit: Angus Martin

2.4.2 Library study settings

Libraries are playing a major role in the delivery of the new learning and teaching approaches through the provision of a rich study landscape to support both individual and collaborative working. Often this is being made possible by the reduction of the amount of space being used to house the library's physical collection of books and journals.

It was reported by many of the libraries in the study that students are increasingly asking for additional individual quiet or silent study spaces that are fit-for-purpose and able to support the use of multiple devices. While the provision of group study spaces continues to be important these are often available elsewhere on campus in faculty spaces or student centres.

At the Flinders University Library, the study settings are being used less for collaboration than in the past and where groups are sharing a study table it is often for 'working alone together' where students are working by themselves but in the company of friends. Their students value the library as a place for quiet working as well as collaboration which can also take place in other locations on campus such as the nearby Student Hub.

The study areas at the University of Adelaide Library are zoned with spaces being designated as 'collaborative',

'quiet' and 'silent.' Refurbishment of the study areas in the Barr Smith Library is creating a range of additional study and amenity spaces including quiet and group study spaces, bookable computers, with specialist software, individual study carrels and study neighbourhoods based around focused collection areas. Silent study is provided in the traditional and opulent main Reading Room. While study spaces are generally available in the Reading Room, the library has noted that some parts are more densely occupied than others and that students often occupy two seats as they don't want anyone else to sit next to them.

The University of Melbourne Library also stated that students want choices about where they study – they like the 'vibe' of the library, the presence of the books and the fact that the libraries are staffed.

In a future library refurbishment, the University of Waikato Library would like to create a Reading Room-type space with distinctive furniture and bookcases to create a scholarly environment that would appeal to 'book-bound' and post-graduate students.

The University of New South Wales Library is also undergoing a phased refurbishment programme with new study areas being created for students. While most study seats are for individual working, discussion and project rooms are also being added as well as collaborative study spaces in areas where the book stacks have been removed.

36 ArchDaily (c)

The Library leadership noted that the main Library is 40-50 years old, and each floor has a different look and feel because of staged refurbishment projects over the life of the building. It was felt that this is a good thing that should be continued during the current refurbishment programme in that it makes each area a destination and gives students choices about the type of study environment they want to use.

As well as study space, the libraries in the study are all providing some level of amenity space in, or adjacent to, the library to support students who may be spending extended periods of time in the library during the day or in the evening. These spaces may include cafes, student kitchens, relaxation areas, recreational maker or craft spaces, computer games areas. These spaces may be noisy and potentially disruptive to students still studying and the University of Notre Dame Australia noted that the social spaces need to be kept separate to the main library spaces.

As part of their refurbishment project a separate social learning hub is being created in the adjacent building that is connected to the library. As well as the social amenity spaces, this hub will also include library equipment loans. the Parents Room, Student Services including IT, learning advisors, Careers and the Indigenous Education Unit.

A year after major refurbishments of Monash University's two busiest libraries, the Caulfield and Matheson Libraries, a post-occupancy evaluation found that students liked having a wide range of study spaces and study seats as well as facilities such as computers, discussion rooms, newspapers reading areas and the coffee shop. They also valued the architecture of the buildings and the provision of natural light and the views out from the Library but they did ask for soundproofing to be added to the discussion rooms.

Seven years on, user experience research with students found that acoustically private study spaces remain important, along with group rooms with white boards, adjustable lighting, portable power solutions and water fountains.

Massey University Library felt that students were generally not demanding in their study respace requirements. They are satisfied if their study desk is well designed with a comfortable chair, power and good Wi-Fi. The most popular study seats in their libraries are those that have book stacks behind them to prevent people walking behind them, group tables with low partitions that work well for 'working alone together' and phone booth-type individual settings. Similarly, a survey undertaken by the University of South Australia Library found that students wanted study seats with good Wi-Fi and power, places to talk and zones for silent study.

Curtin University Robertson Library Refurbishment

The refurbishment of the Robert Library to create more than 2500 study seats included the relocation of the physical collection to Level 2 of the Library. This freed up three levels of the building to create a range of new study areas including a Reading Room, an entire floor to support quiet individual study and other spaces designed for group study or computer use. Other spaces included a 24/7 student kitchen and a large atrium space that includes an informal auditorium and events spaces.[37] The generous spacing provided between study zones has resolved most of the previously reported noise problems in the Library.

There are no signs on the floors to tell people to be quiet – the architecture and interior design makes it clear what the acceptable behaviours are for that zone of space.

Curtin Library refurbishment project visualisation[38]

37 Curtin University Library (a)
38 Builtworks

A student survey at the University of Tasmania also found that students liked having a range of study settings. Desks needed to be larger to accommodate the number of student devices and provision of ergonomic furniture, power, and good quality Wi-Fi were all important. Students also said they would like study desks to have lockable drawers so they can leave their laptop and phone there is they are going to the bookshelves or the toilet and not have to pack up their study space. The demand for quiet individual study spaces was increasing and students liked the old study carrels, possibly because of the need for increased quiet to enable participation in on-line classes.

At the University of Otago | Ōtākou Whakaihu Waka students are still asking for a mix of individual and group study settings in the Library. The Library is undertaking user experience research to explore why students choose particular places to study and to determine what is it about these locations that make them desirable and whether use patterns change over time.

Several of the libraries in the study mentioned that the furniture in the library is frequently re-arranged or moved to meet the needs of the students at that time – whether it is accommodating a larger number of students in a study group or creating an ad-hoc social space. None of the libraries felt this was a problem.

The University of New South Wales found from student feedback that students did not like stools or long benches, they wanted individual task lighting and temperature control, and they preferred movable furniture. One of the consequences of this is that library staff 're-set' the library study spaces several times each day.

The furniture is equally mobile at the University of Waikato Library with students frequently re-arranging the furniture. The library staff also change the furniture configuration from time to time and even bring in furniture from home to create domestic 'living room' spaces. Students notice the differences which is positive and provides opportunities for discussions about the future study spaces.

Informal study and social space, University of Otago Information Services Building.
© Andrew Harrison

Transformation from learning centre to co-learning centre, Helsinki University Library, Finland

The main library of the University of Helsinki was completed in 2012. The neighbouring Learning Centre (2003) was managed by the University's Centre of Information and contained space for students to work independently with computers. The Learning Centre was a response to pre-pandemic, autonomous learning, which was centred around reading, writing, group work and increased use of computers. Scheduled teaching took place in-person in traditional learning environments. There were no drop-in spaces in the Learning Centre for students to participate in online classes or to gather for discussions.

Extensive data gathering from the students through surveys, workshops and interviews revealed that the typical post-COVID day on campus for students includes a varying amount of local and digital presence. The need for remote participation while on campus requires a suitable space. At the same time, the use of active teaching methods and working in groups, both during and between scheduled lessons, are increasing. Additionally, the students stated that the major reasons to come to campus are to meet other students, have lunch together and share daily news.

The Learning Centre, that had been designed to predominantly support individual silent study, needed to evolve and the University Library decided to take over the building and transform it into a Co-learning Centre. An intensive data-gathering and experience design process exploring future social and individual study spaces was undertaken in April and May 2024, including the creation of several pilot spaces. Based on the findings of this process, the future Co-Learning Centre was divided into three functional space categories:

Category 1. Sense of community and recreation - places for social presence

Category 2. Collaboration and teamworking - places for social and digital presence

Category 3. Heads down working - places for individual focus work.

"The intention is to provide both sound of presence and sound of silence for the students."

The renovation of the Learning Centre will be completed in 2025.

University of Helsinki Library student study and relaxation space[39]

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39 Librarybuilders.info

2.4.3 Supporting online learning

The creation of study settings to support active participation in on-line classes by students has been a challenge that most of the libraries in the study have met successfully through the creation of zoned study areas or the provision of additional individual study rooms and study settings with a degree of visual and acoustic privacy.

The University of Sydney Library found that the increase in the number of students engaging in blended learning in study areas was managed easily because of generous size of study spaces and because the students self-police noise levels.

The University of Wollongong notes that blended learning settings in the library require additional acoustic separation and that a new social etiquette is needed to allow the students to use the spaces effectively. To date, students participating in classes using headphones has not been a major problem.

Several libraries did, however, mention that group discussion rooms were also increasingly being booked by individual students for participating in their online classes. To mitigate this, and more generally make it easier for students to find suitable places to join online classes, Simon Fraser University schedules its on-line classes after 4.30pm so that students can go off campus to join these classes.

Finding space in the libraries to host on-line and paper-based examinations was mentioned as a challenge by several of the libraries. Griffith University Library repurposes some of its large 750sqm study areas into examination spaces for around 250 students by moving some of the furniture out and bringing exam furniture in.

During study and assessment periods the University of Technology Sydney Library book out classrooms within the UTS Central building to create additional quiet study areas with roving Library staff who are trained to direct students to relevant supports.

Monash University promotes the Clayton Libraries as 'departure lounges' during the exam period, with flight departure style screens at the Library entrances that display the exams scheduled for that day along with their location.
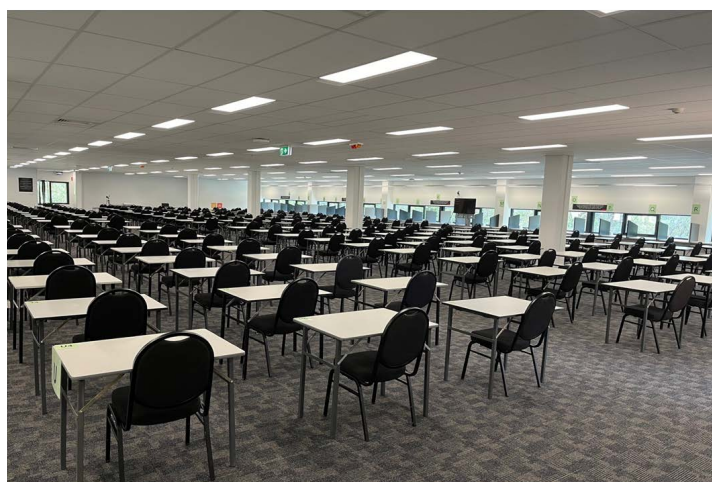
Griffith University Nathan Campus Library study area repurposed as an examination space
Photo credit: Griffith University Library

2.4.4 Technology provision

Many of the libraries participating in this study reported significant reductions in the number of general-purpose computers being provided for student use because more students were bringing their own devices into the library. Simon Fraser University have found that study seats with desk top computers were no longer in demand and the use of loan laptops has also decreased as most students used their own devices. Students did, however like to use the docking stations with large screens.

The University of the Sunshine Coast Library also found that students no longer wanted to use the university computers. There used to be more than 150 PCs located on Level 1 of the library, but they were only being used about 20% of the time so the number has been reduced. The University of Otago has, over time, also reduced the number of student use computers in the main library and there is now only one large bank of computers left in the library.

In response to Monash University's BYOD policy and feedback from students, the Library is focussing on providing ergonomically designed spaces for long-stay study, replacing a proportion of the computers when they're up for renewal with monitors, docking stations and height adjustable desks. Students and staff have suggested these changes to make the spaces more inclusive and comfortable to use.

Flinders University Library stressed that equity of access to technology is critical and for that reason the library continues to provide some desk top PCs as well as loan laptops.

High specification workstations or computers with specialist software may also be required to support specific uses including graphics, video editing, 3D modelling and statistics applications. The Barr Smith Library at the University of Adelaide, for example, provides PCs with the Sibelius music software in the Music Collection area. Griffith University, on the other hand, does not provide any high-specification computers in their library as they found they were generally not used and because the technology changes too quickly to justify the investment.

The University of British Columbia Library has avoided this problem by implementing a technology solution in its Digital Scholarship Lab where students can access 'virtualised' high specification workstations in the Library Research Commons or remotely from any other location.

The libraries in the study are also increasingly providing new types of technology-enabled learning and teaching spaces to support the blended learning curriculum and emerging forms of group working and assessment. The University of Wollongong Library's Five-Year Learning and Teaching vision, for example, included the plan that the library would become a showcase for new technologies and new ways of delivering the curriculum.

Flinders University Library student computer zone
Photo credit: Flinders University Library

The UBC Library Research Commons Digital Scholarship Computers

The UBC Library Research Commons[40]

The UBC Library Research Commons has 18 enhanced PC workstations (11 on-site, 6 short-term, remote-access, 1 long-term, remote access) to support data, GIS, and research projects that require specific software and enhanced computing power. These machines provide equitable open access to resources, including powerful hardware, specialized software, and expertise for all researchers at UBC. Anyone with the appropriate log-in can use the workstations in the Digital Scholarship Lab and access popular paid software for free.

The Digital Scholarship machines are provided specifically for collaboration, flexibility, and ease of use for researchers working on data-rich and visually mediated research. These machines are best used for:

- Researchers, students, or postdocs working on digital scholarship projects that require tools that are unavailable to them elsewhere.
- Researchers exploring unconventional or speculative tools in a supportive environment with access to local expertise.
- Digital scholars demonstrating their scholarship and methods through a multidisciplinary platform connected to the community.
- Work that relies on the software or computing power provided.
- Individuals who need to use sections of the Lab for small group instruction around a tool offered in the lab or methodology supported by it.

There are three ways to use these machines: On-site, in the Digital Scholarship lab, short-term, remote use and 48-hour, remote use. The six remote machines are wiped at logoff, while the one machine that can be reserved for up to 48 hours is wiped at the end the 48-hour reservation, or at patron logoff.[41]

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40 University of British Columbia Library (c)
41 University of British Columbia Library (c)

This plan is currently on hold as the delivery of the library masterplan is currently focusing on the creation of new study spaces.

Several of the libraries in the study had constructed 'Plug and play' recording studios in the libraries, primarily for use by academic staff preparing on-line learning resources to support their blended learning courses. The need for digital media production and editing spaces in the library for student as well as staff use is likely to increase in the future. The RMIT Library noted that new assessment methods such as creating videos, pod casts, models or multimedia presentations are likely to become more prevalent as a response to the use of Artificial Intelligence applications making traditional assessment tasks such as essays and assignments less useful to assess student progress. The Library is currently seeking funding to create a 'Digital Playground' in the library that will contain a range of digital media production spaces, occupying space that will become available as the book stacks are removed.

These digital learning and research spaces may also be part of Library Makerspaces, that may also include 3D printing and rapid prototyping equipment, or Digital Scholarship Centres where they may support the use of 2D/ 3D digitisation, data mining and visualisation applications.

The study settings in the university libraries are generally a key part of a network of informal study spaces that are in Faculty buildings and Student Hubs across the campus. The University of Adelaide, Flinders University and RMIT Libraries, for example, all had large student study areas adjacent to them that were not managed directly by them.

At Waipapa Taumata Rau | University of Auckland, the Kate Edger Information Commons is utilised to provide a broad range of activities. In addition to more traditional services managed and delivered by the Library (e.g., study spaces, student IT support, and academic support for priority groups), the building also houses a number of other services, including a student kitchen, gaming lounge, cafés, and health and counselling services. The facility has a mixed management model, with oversight and coordination from a central Property Services team, some spaces managed by the library, and others by their associated functional areas.

DIY Media Studio, University of British Columbia[42]

42 University of British Columbia Library (d)

At Waipapa Taumata Rau | University of Auckland, the Kate Edger Information Commons is utilised to provide a broad range of activities. In addition to more traditional services managed and delivered by the Library (e.g., study spaces, student IT support, and academic support for priority groups), the building also houses a number of other services, including a student kitchen, gaming lounge, cafés, and health and counselling services. The facility has a mixed management model, with oversight and coordination from a central Property Services team, some spaces managed by the library, and others by their associated functional areas.

Pre-COVID , a review of study seat provision at the University of Melbourne found that the University had a shortfall of 5000 study seats based on the student population at the time. This shortfall is no longer a problem as additional informal study areas have been created in each of the university precincts that has taken the pressure off the Library. The Library is, however, involved with the planning of the new study spaces in the precincts to ensure that they work well and provide a high-quality student experience.

The University of Waikato Library on the Te Whare Wānanga o Waikato's Hamilton Campus provides a range of study spaces for both individual and collaborative study within the library. The types of study space in the library provided in the future may change in response to the completion of the adjacent Pā building. The Pā is a student hub featuring social and learning spaces, a large stage to cater for university and community events including graduation, a food court, and a dedicated space for tauira Māori.[43] Te Āhurutanga: the Student Hub is designed as a central meeting space that honours the history of the site as a student safe-haven, cultural centre and gathering site for the University community.[44]

The Pā opened in July 2023 and the Library leadership are waiting to see how the new Student Hub will impact how students want to spend the time they are on campus and possibly change the way that students use the Library.

The management of the informal study spaces outside of the library was seen as an important issue by many of the libraries in the study. Frequently the study spaces in Faculty or Student Hub buildings are not actively managed or staffed and the quality of the spaces can degrade over time due to lack of maintenance or technology support.
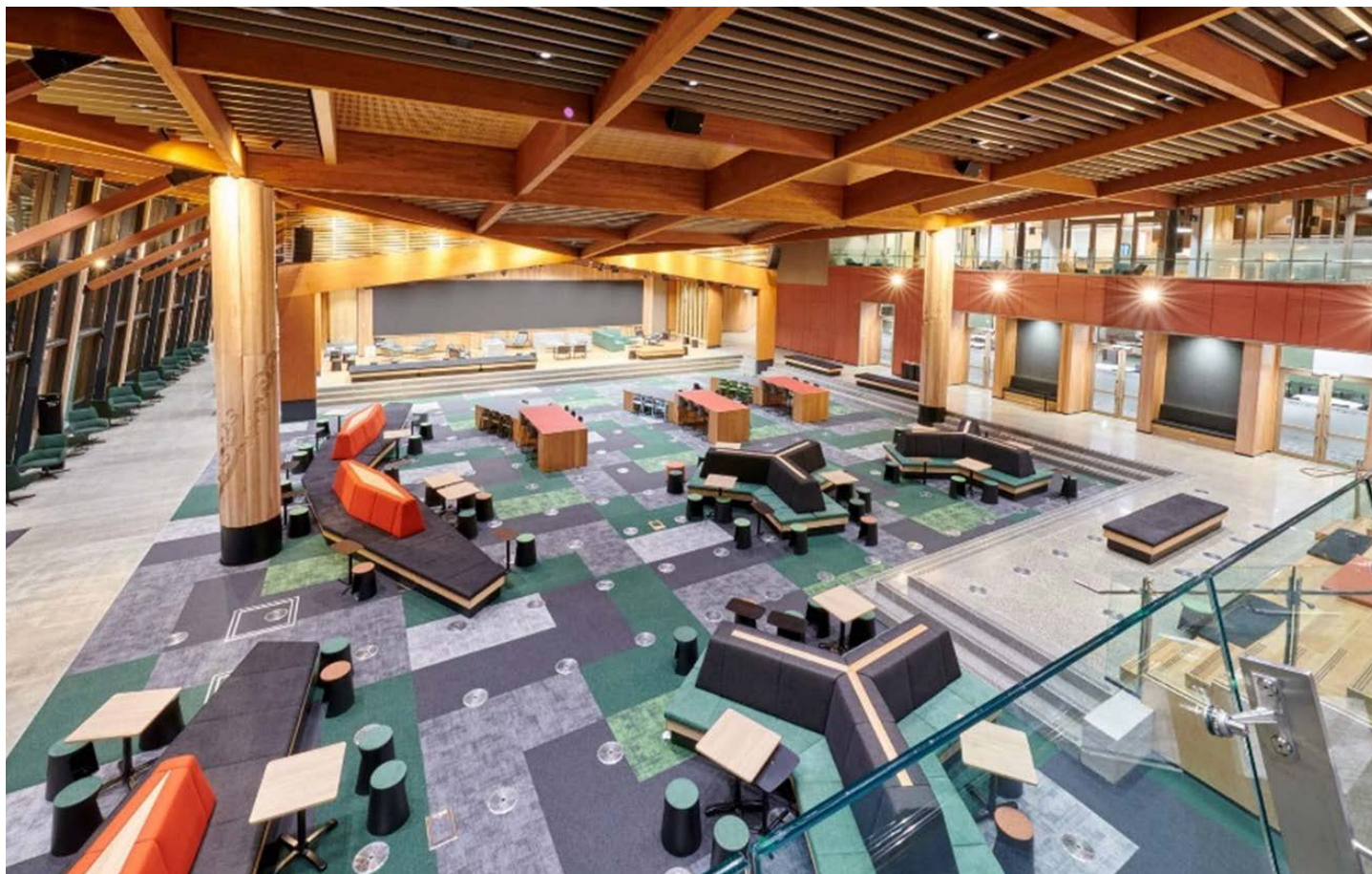
Te Āhurutanga: the Student Hub at University of Waikato[45]

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43 Waikato Herald (2023)
44 University of Waikato
45 University of Waikato

RMIT Academic Street study settings[46]

The RMIT Library is directly connected to 'The New Academic Street'. This 2017 project included over 30,000m² of refurbished space in four existing buildings, together with three new buildings totalling approximately 6,000m². The project included a major refurbishment of the library, increasing the amount of study space by 200% and the creation of a hub for learning, collaboration, and innovation.

"New learning spaces engage with the city and campus by opening out to balconies and rooftop gardens to provide students with access to landscapes and fresh air. All new spaces are designed to act as social or learning spaces, allowing students to define their experience of the campus. At the heart of the redevelopment a new student services hub, RMIT Connect, provides an integrated model for delivering student services, using technology to provide consultations with students on an individual 'side by side' or 'person to person' basis. Through these strategies, the student experience is transformed through new learning spaces, and is bound up with the life of the city; made both more open and visible."[47]

The RMIT Library noted that the New Academic Street is, in many ways, seen as a casual extension of the Library, although none of the collection is housed in the Street and the spaces are not managed by the Library.

The study spaces in the New Academic Street are very popular with students and they may not always know where the boundary between the library and the New Academic Street is located. Over time it became apparent to the Library that some of the study spaces in the Street were not being managed effectively in terms of basic maintenance and technology provision so the Library has taken them over and now pays for technology upgrades out of its own budget.

The University of Technology Sydney Library is responsible for the management of all informal study spaces located throughout the library building and across campus, creating a library presence beyond the library gates. Each of these spaces is supported by appropriate technology, managed through the library booking system and promoted through library communications channels. Library branded signage that promotes respectful behaviour and engagements that create safe spaces is a key part of managing these areas, drawing on the trusted brand of 'Library' in creating a coherent look and feel to study spaces across campus. One of the issues that the library faced moving into a newly designed building was the oversupply of lounge style furnishing in informal study spaces that did not align to student demand for good quality study desks and chairs and a quiet study environment.

46 ArchDaily (b)
47 ArchDaily (b)

The Library has also taken over management of other under-utilised spaces in the building within which the Library is located. The café, for example, was repurposed as a Student Kitchen and the Library curates these spaces and offers activities and services in the spaces, linked to the needs of the students at that stage of the academic year, including bringing in Student Services and other to run events. The library leadership stated that it has taken time and a cultural shift for library staff to think about all of these external spaces as part of the library, but this has now been achieved.

The University of Sydney Library is also responsible for five learning hubs on campus. These hubs are strategically located around the campus and some previously had been smaller library spaces that have been repurposed after the collections were brought into the main Fisher Library. The learning hubs are not permanently staffed, and they do not contain parts of the library collection. The Library does hold events and activities in these spaces to activate them and roving library staff keep an eye on these spaces to ensure they are in good condition, tidy, and the technology is working. The Hubs are very popular with students as they are often located close to teaching spaces, and may create cohort building experiences for some disciplines.

The University of Bristol Library manages eight libraries, four study lounges and study centres cross the university, a museum as well as the University art and public art collections. The number of libraries may be consolidated in the future following the construction of the new Central Library, but they would not like to lose these spaces close to the Faculties as they are an important part of Faculty identity and student life. Instead, they would like to create additional study spaces and 're-imagined libraries' in these spaces.

Library spaces and the study lounges at the University of Bristol are carefully managed by the library, and they work closely with the University's Facilities Management, IT and Student Well-being teams to ensure that everything is working well in all of their spaces. There is an inconsistency of service availability across the several hundred University buildings and coherent service design, including the creation of digital-forward accessibility and integrated "student hubs" is at the core of the Library's forward planning, The Library is part of the 'Learning Campus Strategy Group' which is developing design principles and a roadmap for all the learning spaces from formally timetabled to social spaces, in response to a curriculum increasingly moving towards active learning and authentic assessment, to ensure that the campus is fit for purpose into the future.

While several of the library leadership teams said they were reluctant to take on the management of all informal study spaces outside the library within their current staffing and budgetary constraints, it was felt generally that there needed to be an overall campus study space strategy in place to ensure the provision of a consistent, high-quality study experience for all students and that the Library should be a key stakeholder in the development and management of these study spaces.

Abercrombie Learning Hub, University of Sydney Library[48]

48 University of Sydney Library (f)

Summary

The library will continue to support changes in curriculum and pedagogy through the evolution of its collections, the services that it provides and the study spaces that it offers.

It is clear from the universities in this study that the study space landscape, both within and beyond the library, will continue to develop to create a wide range of inclusive and welcoming study environments, supporting a variety of learning and study approaches, levels of technology usage and individual student preferences.

Key Findings:

1. Library staff continue to play a major role supporting teaching and learning across the University, particularly in relation to the creation of digital learning resources.

2. Increased use of active and blended learning to deliver the curriculum is creating pressures on library spaces – issues of zoning of space, visual and acoustic separation of study zones becoming even more important.

3. Increased requirement for spaces and rooms that allow active participation in on-line classes and spaces for collaborative working and a corresponding increased demand for silent study spaces away from group study and students participating in online seminars.

4. Students are wanting a greater variety of study spaces and greater level of control over their study environments - movable furniture, adjustable lighting, and temperatures controls.

5. Increased use of high-backed furniture and pods which give students a feeling of enclosure and a corresponding lack of demand for high stools and low bench type seating arrangements.

6. Increase in demand for workspaces large enough for multiple devices and desktops with for plug and play desktop screens.

7. Changes to the way learning is delivered and assessed is changing the annual and weekly utilisation of the library spaces.

8. Increasing demand for high-speed Wi-Fi due to the increase of students using the library for online lectures and seminars and video streaming

9. Many students are spending extended periods in the library as they are using the library to attend classes, study, and complete assignments. To support this extended library many of the libraries are increasing the level of student amenity spaces close to the study areas including cafes and student kitchens, recreational reading areas, games spaces, sleep pods and outdoor garden spaces.

10. Decline in the use of University PCs but the demand for high performance PC's or specialist software remains.

11. Provision of digital learning spaces to create a central location for students to access to new technologies and equipment.

12. Increased demand for recording studios and booths for students and staff to prepare videos, pod casts and multimedia presentations.

13. Increasing provision of study hubs distributed across the campus with limited co-ordination and varying levels of library engagement.

Enhancing University research and innovation.

All the libraries in the study played a major role in their institution's research activities in terms of supporting HDR students through the provision of online and face-to-face research skills classes and one-on-one research consultations, the active participation of library staff in faculty research projects, the establishment of data repositories and managing the bibliometric and research profiles of individual academics.

The Library's contribution to research and scholarship was described by Professor Liz Johnson, Deputy Vice Chancellor Academic at Deakin University in the Foreword to the Deakin Library Plan 2022-2025 'Accelerating ideas to impact.'

"Academic libraries epitomize scholarship. In 1990, Ernest Boyer captured the essence of academic scholarship in his celebrated paper Scholarship Reconsidered: Priorities of the Professoriate. Boyer described four kinds of scholarship – discovery, integration, application and teaching – advocating all as equally important and interdependent. This description of academic practice is still powerful today and helps to explain why libraries are so central to their universities. Libraries develop, manage and curate knowledge for and from all forms of scholarship. They help people – students, teachers, researchers, professional staff and partners – to engage with knowledge and use it to further all forms of scholarship. They help people understand knowledge and how it is used."[49]

The first priority discussed in the Library Plan is the acceleration of Deakin's global reach and impact. The document notes the important contribution of the Library's strategic approach to open education and open access to Deakin's aspiration of creating a more just and progressive society by removing barriers to information and maximising opportunities for engagement with Deakin's discoveries, educational resources and research outputs.[50]

During the discussions for this study, Deakin University also stated that the library is a showcase for the university's cultural position and is part of the country's cultural history. The library is not a neutral space and should take a position on issues such as decolonisation and create spaces that deliberately include rather than exclude.

Monash University Library is undertaking a service design project to reimagine the Library's research services. Libraries across the sector recognise the opportunities to provide support across the research lifecycle. Monash University has a significant and growing research profile that is becoming more complex, which sees more and varied research funding and an emerging emphasis on issues such as responsible research cultures. It is important that the Library is aligned with these kinds of activities and strategic priorities. The Library has also identified a growing need for open scholarship and research support in the University.

The libraries interviewed for this study were all playing key roles in the delivery of the University's research programmes with frequently cited roles including:

- the provision of the research collections
- research support for individual research students or research project teams
- provision of digital scholarship services and technology
- research data preservation and management
- the management of institutional data repositories
- scholarly publishing and communications
- creation and publication of open access research outputs
- management of researcher profiles and bibliometrics
- research skills development for undergraduate and postgraduate students.

2.5.1 Technology provision

The importance of the library in helping students develop the research skills they need to succeed has long been recognised. The University of Melbourne's 10-year Scholarly Information Future strategy, for example, stated that:

"Scholarly literacy will be integral to our students' ability to work across different domains of knowledge. In a rapidly changing information landscape they will need the knowledge and skills to be discerning information seekers; to find, manage and create scholarship which represents different ways of knowing; to engage with research data, with scholarly and professional publications and with related technologies. The University seeks to expose all undergraduate students to genuine research and knowledge transfer experiences. We will support such experiences using new and innovative digital ways of engaging with scholarly information and technologies, developing our graduates' skills in the recognition and production of various forms of scholarly work."[51]

Library skills development courses were traditionally held in classrooms within the library or in general teaching spaces around the campus. Even prior to COVID , many universities were moving towards more on-line delivery of library skills courses and the provision of self-help online resources to reduce the number of face-to-face student enquiries and requests for support. COVID has, in many cases accelerated the move to online delivery of courses and support.

Waipapa Taumata Rau | University of Auckland, for example, provides tired student support, with Tier 0 being self-help on-line student support. Te Tumu Herenga | Libraries and Learning Services has invested in the development of a comprehensive set of online learning resources that the students can access at any time and the use of these resources' answers around 80% of all student enquiries. Level One enquiries are more general in nature and likely to deal with navigation around the collection or the library itself.

49 Deakin University Library (a), p. ii
50 Deakin University Library (a), p. 14
51 University of Melbourne (a), p. 5

Level Two are more complex enquiries and Level Three enquiries are categorised as 'expert engagement.' Resolving most queries with self-help resources allows better focus on the more complex enquiries. As the Library noted, Waipapa Taumata Rau | University of Auckland is a community of 50,000+ people and the library would never have the capacity to answer every Level 0 enquiry face-to-face.

Monash University Library has implemented a tiered approach to their services managing user interactions through a customer relationship management system to ensure services and resources that support education are strategically targeted, provided at scale, and underpin a consistent student experience. Across all service channels, from chat bot to staff facilitated virtual and in person services, the goal is for enquiries to be resolved with a minimum number of referrals and using a consistent tone.

The RMIT Library noted that students often prefer to contact library staff online via Chat rather than face-to-face even if they are in the library. The students don't want to pack everything up before going to find the library staff or risk losing their study seat. As a result, a much smaller cohort needs to speak to library staff directly and they need to book an appointment to do this.

Simon Fraser University has also found that postgraduate students prefer online services for research support sessions including thesis consultations.

Research skills classes are increasingly being delivered on-line, although some of the libraries in the study still provided a mix of face-to-face and online classes to support student preferences. Moving the classes on-line has allowed the University of British Columbia, for example, to increase class sizes from around eight students to 120-150 students on-line.

Flinders University has also found that on-line classes are now more popular with students than face-to-face sessions with online sessions now having 80+ students participating as opposed to 12 in a classroom. The library classroom has now been made available for general study or as timetabled teaching spaces

2.5.2 Post-graduate study spaces

The libraries in the study varied widely in terms of the provision and success of dedicated postgraduate study and research spaces for HDR students. Provision ranged from no defined HDR spaces to bookable study carrels, postgraduate reading rooms, and postgraduate common rooms containing both study and social spaces -combined with access to library and research expertise.

The provision of dedicated HDR space in the library often depended on what space was available for these students in the Faculties and the demand for these spaces by students.

The University of Hawai'i at Manoa Library provides study carrels for postgraduate students who are working on their thesis. These require written authorization from their academic department and are only available for one semester at a time. The Library would like to create a Graduate Centre as part of a future refurbishment project as there is no identifiable space for the 2700 graduate students on campus. While PhD students may have office space in their Department, Masters' students don't have any dedicated spaces on campus.

Graduate research spaces at the University of Melbourne's Baillieu Library includes a dedicated study space with power-enabled desks for 24 students as well as four graduate study rooms which can be booked for one-hour periods. Other graduate study spaces are available in the Graduate Student Association space and in the Research Commons located in several locations across the campus. These spaces also contain quiet spaces for writing as well as a kitchen, seminar rooms and lockers.

The need for the Research Commons was outlined in the University's Scholarly Information Futures 2020-2025 paper:

"We will also create Scholarly (Research) Commons, integrated into existing scholarly spaces, where graduate researchers can work, socialise with peers across disciplines, and access a range of specialised curated programs and services. These 'third place' contexts provide a supportive context for graduate research, away from the pressures of the lab or home life and enhancing interdisciplinary connections and actively supporting the transition to academia or employment."

At the University of Technology Sydney, the Library includes the UTS Scholars Centre which is a dedicated study space for HDR students to work on their research. The Scholars Centre has desks, desks with computers, quiet rooms and meeting rooms that are all bookable. HDR students' preference these types of spaces where they can settle-in to quiet offices, especially during the last 6-12 months of their degree when they are writing up their research. Other HDR spaces on campus have varying utilisation rates, with some areas significantly underutilised. It was suggested by the Library that in the early years of the research degree Faculty-based space is important as it helps students to develop connections to the academic staff but in the later stages of their degrees quieter, better designed and supported spaces are needed.

52 University of Melbourne (b)
53 University of Melbourne (c), p. 4

Taught postgraduate study space. The Quarter. University of Sydney.[54]

Research space for PhD students across the Faculties at the University of Sydney is variable. However, the former Badham Library space on the Camperdown campus has been refurbished to create The Quarter – a post-graduate student coursework space. The Quarter includes silent and quiet study spaces, group study rooms, training rooms, computers with assistive technologies, a kitchenette, and vending machines and peer learning advisors.
This space has swipe card access and is open 10am – 7pm Monday to Friday and Saturday 11am- 4pm and students can reserve spaces to study or host an event in the space.

A new post-graduate research student study space has opened in the former Macleay Museum building on the Camperdown campus. Co-designed with students, the new study space has two separate adjacent zones. One is for quiet study and writing while the other includes social space and a kitchenette.

Provision of space for HDR students is also very variable in quality across RMIT and the library would like to provide better space for PhD and Masters by Research students. A business case has been prepared to create a Centre for Open Scholarship in the Library in space where library stacks have been removed. This Centre would include both individual study spaces and group spaces for intensive research projects.

At Simon Fraser University's Vancouver campus, the library is housed in a leased building. The Graduate Research Commons was created on another floor of the same building. The Research Commons "contributes to the ongoing success of SFU's graduate researchers and postdoctoral fellows by providing a comfortable and inspiring space in which to work and offering services that directly support research."[55] The Commons provides a range of individual and group study spaces and areas for discussions.

Staff in the Commons also provide writing and publishing support, including help with academic writing, thesis formatting, and scholarly publishing support to SFU graduate researchers across all disciplines.[56] The Research Commons space at the Vancouver campus is very popular and many of them no longer use the library itself.

2.5.2 Accelerating and supporting enterprise

The contribution of the libraries to the University's innovation and enterprise goals was explored during the discussions with the library leadership teams. This seems to be an under-developed opportunity for the libraries with very few of the libraries actively engaging with industry or supporting the creation and development of university or community-led businesses.

54 University of Sydney (b)
55 Simon Fraser University (a)
56 Simon Fraser University (b)

The University of British Columbia Library manages the Innovation Library that operates out of the nearby Okanagan Regional Library in downtown Kelowna. This multi-purpose space supports all UBC students, faculty, and staff as well as community businesses and researchers in the region. It hosts a range of activities including meetings, research collaborations, focus groups, seminars, classes, and book clubs.

The University of British Columbia Library is also responsible for the Small Business Accelerator. This offers free on-line access to reliable business information and tools for secondary market research for British Columbia businesses and entrepreneurs. As the website for the Accelerator states, the tools on the website can be used

"…. to structure your market research, grow your business, gauge potential market size or learn the latest industry trends. Managed by specialized librarians, the Small Business Accelerator (SBA) provides free access to reliable resources to help you build a successful business."[57]

The types of tools and resources provided on-line in the Small Business Accelerator can also be provided in a physical library space that can function as a hub for the development of university and community businesses. The Business and Intellectual Property Centre at the British Library in London is a good example of this type of hub.

UBC Library Innovation Library at the Okanagan Regional Library[58]

57 University of British Columbia (e)
58 University of British Columbia Okanagan Library

British Library: Business and Intellectual Property Centre

The Business and IP Centre was set up in 2006 with funding from the London Development Agency to support "entrepreneurs, inventors and small businesses from that first spark of inspiration to successfully launching and developing a business."[59] The BIPC Reading Room consists of two floors. The lower floor includes an exhibition area, a selection of business resources and an open meeting space that anyone can use. Other spaces include meeting and events spaces, consultation rooms and collection space housing trade and industry related journals and newspapers.

The BIPC provides users with access to the British Library's collections of business and intellectual property information, industry reports and proprietary market research reports as well as:

- 1-to-1 advice from staff to discuss the feasibility of a business idea or plan and available resources from the BIPC or elsewhere that might be useful
- IP Guides for researching copyright and IPR
- Workshops and webinars on skills and other topics essential to starting one's own business
- Paid research services
- Support from alumni network of people who have used the BIPC and made their business a success
- Business mentoring scheme
- Recommendations for specialist external consultants.

In addition, many of the public areas of the British Library have been used to create a wide range of individual and group work settings and these spaces function as co-working spaces for the emerging businesses supported by the Business and Intellectual Property Centre.

Business and Intellectual Property Centre at the British Library[61]

59 UK Parliament (2010)
60 British Library
61 Careershifters.org

Summary

The University Library will continue to play a vital role in the delivery of the institution's research and innovation strategy through the provision of a wide range of research support services, leadership in the development of digital scholarship expertise and the creation of effective and supportive study spaces to support HDR students and researchers.

However, there are opportunities to take this further in the future, including the direct provision of business incubator/ accelerator spaces and services, the hosting of library events with local businesses and the creation of co-working spaces that support both students and community businesses.

Key Findings:

1. Research and digital skills classes are increasingly being provided online allowing improved flexibility and efficiency and reducing the demand for classrooms in libraries.

2. Students and researchers are generally preferring to access library support online.

3. Library support is being provided in a tiered structure, often with around 80% of enquiries being resolved through online self-help allowing staff to focus on those requiring person help or expert support.

4. Libraries are generally providing academic staff with support for open-source publishing and development/ acquisition of open educational resources.

5. Several of the libraries in the study have developed, or are planning to develop, enhanced HDR hubs or research commons where graduate researchers can work, socialise with peers across disciplines, and access a range of specialised curated programs and services such as publishing and research support.

6. Few of the libraries provided dedicated spaces or facilities to support taught Masters/ postgraduate Professional Education students.

7. There is an increasing demand for silent study space for HDR students to "shut up and write". While they may be provided space in the Faculties this is likely to be shared office that may not be provide the environment they require in the latter phases of their research.

8. Increasing interest in the provision of business incubator and /accelerator spaces to encourage interdisciplinary research, entrepreneurial activity, and collaboration with industry.

2.6

Championing digital scholarship.

Digital scholarship was defined by Abby Smith Rumsey, Director of the Scholarly Communication Institute at the University of Virginia, as the "use of digital evidence and method, digital authoring, digital publishing, digital curation and preservation, and digital use and reuse of scholarship." [62]

This very broad definition covers a wide range of tasks that can take place within a research library or elsewhere on campus. These can include relatively common tasks such as digitising analogue media and reformatting a variety of media, creating metadata, and creating digital collections and exhibits. It also can include text-encoding and analysis, encompassing not only geospatial information (GIS) and digital mapping, 3-D modelling, and digital publishing support, but also database support, software development, and interface design.

Digital tools and data sets and methods increase access as well as generate new possibilities for interactive use and re-use by researchers and students. These activities can produce new forms of hybrid and multimodal scholarship that can combine print and web-based text, video, audio, still images, annotation, and new modes of multi-threaded, nonlinear discourse that can exist only online.

STEM subjects have been the pioneers of integrating digital tools and methods into their research processes but now these are also having a transformative impact on the social sciences and the humanities where engagement with big data, multimedia, interactivity, and data visualisation are rapidly changing how research is envisioned and conducted, how data are presented and shared, and how scholarship is integrated into experiential teaching and the ongoing scholarly discourse. [63]

There are considerable overlaps between Digital Scholarship and Data Science, and, in many cases, the terms can be used interchangeably. Data Science combines domain expertise, programming skills, data mining, predictive analytics and knowledge of mathematics and statistics to extract meaningful insights from data. Data science practitioners apply machine-learning algorithms to numbers, text, images, video, audio and more to produce artificial intelligence (AI) systems that perform tasks that ordinarily require human intelligence. [64]

The diagram below illustrates the five stages of the data science life cycle described on the Berkeley University 'datasciences@berkeley' web page: **Capture**, (data acquisition, data entry, signal reception, data extraction); **Maintain** (data warehousing, data cleansing, data staging, data processing, data architecture); **Process** (data mining, clustering/classification, data modelling, data summarization); **Analyze** (exploratory/confirmatory, predictive analysis, regression, text mining, qualitative analysis); **Communicate** (data reporting, data visualisation, business intelligence, decision making). [65]

The provision of data scholarship services and spaces within the libraries in this study varied widely. Many libraries are focusing on 'below-the-waterline' digital scholarship activities such as research support, data repository management, meta-data development, open access publishing, digitisation, and the management of the library's digital collections. These activities don't necessarily require dedicated spaces or staff – they are part of 'business as usual' for many of the libraries.
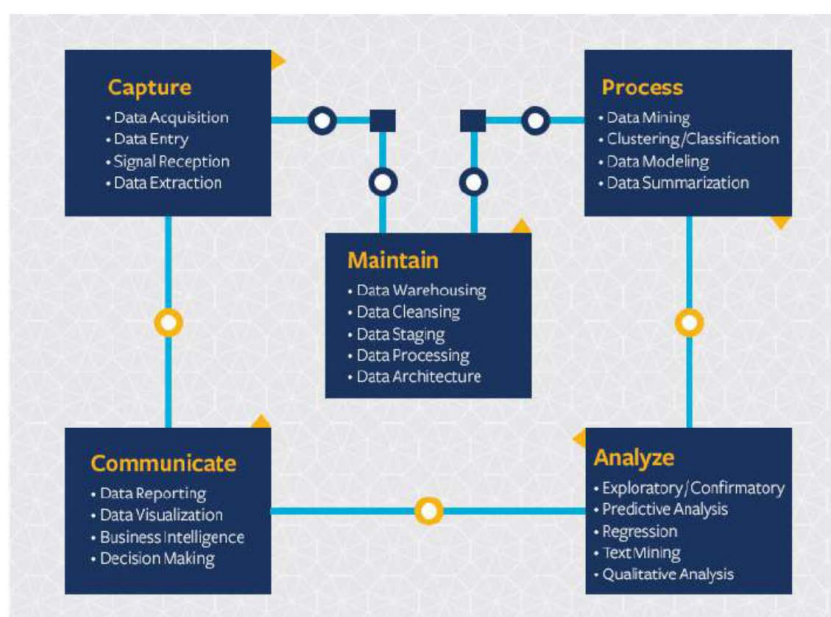
Data science life cycle. Source: Berkeley University (2019) [66]

62 Queen's College Library
63 Mulligan 2016
64 Datarobot 2019
65 Berkeley University
66 Berkeley University

Massey University, for example, stated that the Library's activities in this area currently focused on the provision of digital research services provision and on data management and curation and these activities did not require a dedicated space. Similarly, digital scholarship in the University of Canterbury Libraries focuses on service delivery rather than on the provision of dedicated spaces, A key focus for the Library is Open Research Publishing and they were the first academic library in Aotearoa to appoint an Open Education librarian to champion the issue. Rather than staffing up the library with Digital Scholarship staff the Library aims to work with other university Units or Departments that are already delivering the required services elsewhere on campus including Research Innovation, Digital Services, the Graduate School and the Digital Humanities programme.

Several Libraries reported that it was sometimes difficult to connect into the Digital Scholarship activities that are taking place elsewhere on campus in academic departments.Curtin University Library noted that digital innovation across the university tended to be very compartmentalised and there was not much connection with the Data Science Innovation Hub and other campus Digital Scholarship initiatives, There are opportunities to work together more on initiatives and to support this the University should develop a Digital Roadmap to co-ordinate all these activities.

Griffith University Library provides leadership in the implementation of Digital Scholarship policies and practices, including the increasing drive towards open research. The Library also leads, and delivers, services to support best practice in scholarly communication through traditional and alternative publishing models. The Library is also responsible for Creative Works – a repository of research outputs from creative researchers (https://griffith.figshare.com/).

Creative Works is …. *"a research repository designed to publicly showcase your creative research outputs and display a wide range of media files, from images, video and audio to interactive 3D models. It is based on Figshare for Institutions and provides an improved submissions portal for creative works researchers. Figshare is an online repository where researchers can make their research outputs available in a citable, shareable and discoverable manner. This platform will provide a more impactful description and discovery for creative works."*[67]

While no major library redevelopment projects are planned at Griffith University in the next five years, the Library remains central to the student experience and has aspirations for student studios, AI labs and presentation spaces where the Library can platform diverse learning approaches that will be central to stimulating new curricula and experiential learning opportunities.[68]

The Data Fluency program at Monash University is a cross-disciplinary initiative by Monash University Library, the Monash Bioinformatics Platform and the Monash eResearch Centre (MeRC). This program delivers general training to build research capacity to use, explore, interpret, and visualise data. The program is currently being reviewed in light of Monash University's recent Digital Research Plan and will play a key role in the provision of training support to create a digitally skilled Monash student and staff community.

At Simon Fraser University a dedicated space to support digital scholars is provided in the W.A.C. Bennett Library at SFU Burnaby and in meeting spaces on the Vancouver and Surrey Campuses. The Digital Humanities Innovation Lab (DHIL) *"assists SFU researchers with the development of digital scholarship by providing consultations, training, mentoring, research software development, and technical support. We foster collaboration and interdisciplinarity across faculty and promote the development and dissemination of high-quality research that positions SFU as a world leader in digital scholarship…..the DHIL leverages the Library's expertise in digital initiatives, unique special collections, and research skill-development programming."*[69]

2.6.1 Artificial intelligence (AI) and the library

The meteoric rise of AI applications and their impact on learning, teaching and research is a critical issue for all universities. A discussion session at the December 2023 Library and Information Association of New Zealand Aotearoa concluded that AI is likely "to impact the areas of information literacy, descriptive practices and collection analysis. It was predicted to lead to efficiencies with its ability to analyse large data sets quickly, summarise information and automate processes. It would also lead to new roles for librarians, such as teaching how to create effective prompts and educating communities on common problems. Libraries could also provide access to paid AI tools to address the digital divide and advocate for responsible use of data when training AI. This could include the Aotearoa New Zealand context to ensure Māori lead the conversation on AI and the use of Indigenous data."[70]

Many of the libraries in this study were already heavily involved in initiatives to understand how best to incorporate AI applications within the institutions learning, teaching and research activities and make use of these applications to gain new insights from their digital collections.

The University of the Sunshine Coast believes that AI should be a core element of the Library's information literacy programmes – teaching students how to use AI responsibly and how to reference AI generated artefacts.

67 Griffith University (b)
68 Griffith University (a), p.14
69 Simon Fraser University (c)
70 Libraries Aotearoa

The Flinders University Library led the development of the University's AI policy, and the library website includes pages on the use of AI tools for study and research, covering topics such as:

- What is AI
- Appraising AI tools
- Using AI for study
- Using AI for research
- Using Chat GPT[71] [72]

The library is also interested in using AI to work with big data sets and several pilot projects have been completed.

The University of Bristol Library and the Academic Skills Team led the production of the University guidance for the use of AI. The Library is also considering the use of AI to analyse some of its digital collections. One project that is planned is to work with the University's Jean Golding Institute for Data Science to analyse the Library's Wildfilm Archive, which includes material from filmmakers associated with the BBC Natural History Unit, to explore at the impact of climate change on the environment.

The Library also worked with the Jean Golding Institute for Data Science and the Brunel Institute on the mapping of the social network of Isambard Kingdom Brunel using the Library's Brunel Archive. Work with the Brunel Institute also includes research and outreach to local schools with collections-based engagement which embeds the archive in the taught curriculum.

A 2023 International Federation of Library Associations and Institutions (IFLA) article "Developing a library strategic response to Artificial Intelligence" stated that the *"most powerful applications of AI for libraries are of "descriptive AI" which can be used to make all kinds of material (photos, videos, sound, manuscripts) in collections machine readable data through such techniques as computer vision or sound to text, and provide description at scale for information retrieval (Cordell, 2020). Some libraries have special collections that could be made more accessible using these means; for others it may be more relevant to have access to an infrastructure around licensed or open content. Many technical challenges remain with digitization and attempts to automate description of historic collections."*[73]

Further challenges for the use of AI with Special Collections were discussed in a recent New York Times guest essay, A.I. Is Coming for the Past, Too, by Jacob N. Shapiro and Chris Mattmann.

WHEN COULD I GET IN TROUBLE USING GENERATIVE AI?

There are several instances where the use of artificial intelligence tools like ChatGPT or Bard when undertaking assessment pieces may constitute academic misconduct, as per the University's *Student Academic Integrity Policy*. Examples include:

- Using generative AI beyond what is permitted by the topic coordinator. Some topics may not allow the use of AI or may only allow its use with certain limitations. If the topic information or assessment instructions specify how AI can be used, be sure to stay within these guidelines. If you are unsure, check with your topic coordinator.

- Submitting output generated by generative AI as your own work. This may constitute contract cheating which is, at minimum, Level 2 Academic Misconduct.

- Not properly citing output generated by generative AI. Ensure you cite output generated by generative AI according to your topic's preferred referencing style. The APA 7 and Harvard referencing guides have been updated to include acknowledgment of generative AI tools.

- Not acknowledging your use of generative AI. You must provide a declaration acknowledging how you have used AI. This should be included either as a footnote or at the end of your reference list —

Using generative AI (Chat GPT, Gemini etc). Extract from Flinders University Student Learning Support Services guide 2024[74]

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71 Flinders University Library (a)
72 Flinders University Library (b)
73 IFLA
74 Flinders University (b)

They stated that *"the same generative A.I. that can fake current events can also fake past ones. While new content may be secured through built-in systems, there is a world of content out there that has not been watermarked, which is done by adding imperceptible information to a digital file so that its provenance can be traced.*
Once watermarking at creation becomes widespread and people adapt to distrust content that is not watermarked, then everything produced before that point in time can be much more easily called into question."[75]

And this will create a treasure trove of opportunities for backstopping false claims with generated documents, from photos placing historical figures in compromising situations, to altering individual stories in historical newspapers, to changing names on deeds of title. While all of these techniques have been used before, countering them is much harder when the cost of creating near-perfect fakes has been radically reduced."[76]

2.6.2 Space for digitisation

Alongside the development of digital book and journal collections the libraries in this study were all undertaking digitisation projects working with their Special Collections or the University Archives. In addition to the actual digitisation of the material, other tasks involved may include selection and preparation of collection materials, copyright clearance, creation of metadata, provision of a delivery mechanism and implementation of digital preservation strategies for the digital images.[77]

The University of Melbourne wants to enhance discovery and accessibility of its Special Collections and Archives. The University is continually increasing capability and capacity in its Digitisation Centre as it works in close collaboration with the curators of the University's 42 cultural collections and academic community to digitize content in support of learning, teaching, and research. Linked to this, a digital assets management platform will be established in 2024, and this will also be linked to the Indigenous Data Network (IDN).

The University of Tasmania Library also stated that there is a need for a Digitisation Studio to create high quality 3D digital records of items in the University's cultural collections. This Studio could be shared with other institutions such as the State Archive to share costs and expertise. The example of what this would allow was the creation of a 3D scan of a Tasmanian Aboriginal canoe that was available for use by students.

Flinders University Library has recently established a Digitisation Lab in the Main Library that brought together digitisation equipment that had previously been in various parts of the building. This Centre is reading and converting print and legacy audio recordings into digital formats to widen access to the Special Collections, providing researchers with digital copies of primary research materials and creating opportunities for object-based learning.

Post-pandemic and the introduction of hybrid work, Monash University Library has consolidated workspaces to convert former office space into a new digitisation centre, funded by a bequest. The new space will be a focal point and showcase for the preservation and improved access to special collections.

3D photogrammetry scan of the model paperbark canoe made by Uncle Rex Greeno. University of Tasmania Library and Cultural Collections[78]

75 Shapiro and Mattmann
76 Shapiro and Mattmann
77 Youngs (2016), p.6
78 Sketchfab

The University of Wollongong Library's Archives Online project now includes more than 12,800 items, including the digitisation of several large-scale collections. A priority for the Library when digitising its collections was adopting and complying with contemporary standards for archival descriptions. The Archives Online platform had more than 2.9 million page views in 2021 which was a 34% increase on the 2020 total. Archives Online has become a strong source of historical content and engagement for the Illawarra community and beyond, with unique system features allowing users to tag and comment their own stories about people, places, and things.[79]

One of the goals of the University of Hawai'i at Manoa Library's digitisation programme is to allow the digital return of items in the collections to their originating country where they may no longer exist because of climate change or war.

The University of British Columbia Library's Digitization Centre is *"a collaborator and leader in the creation, access and preservation of digital materials. The Library's Digitization Centre embraces new technology, methods of access, workflows and preservation strategies while building sustainable digital collections to support and enrich the educational, cultural and economic endeavors of the University, the People of British Columbia and communities beyond."*[80]

The Digitization Centre has a fully functioning lab with specialized scanning equipment to accommodate a wide range of materials. As well as a magnetic wall that allows for the image capture of large format items that cannot be put through the scanning equipment, the Lab also has 17 document and object scanners able to digitise 2D and 3D objects, both bound and unbound.[81]

The new University of Bristol Library will include a Centre for Cultural Collections on the lower ground floor. This will incorporate a Digitisation Centre for 2D/3D and hybrid digitisation that will be funded by the Arts and Humanities Research Council and Research England. This Centre currently exists as a virtual entity, but the new library will provide the opportunity to bring all the equipment and expertise together in one place.

In 2015 the Digital Preservation Coalition (DPC) noted that digital materials - and the opportunities they create - are fragile even if they also have the capacity to be durable through replication. Digital platforms change and the long chains of interdependence on which they depend are complicated and fluid. Their longevity and utility is threatened where contents or contexts are lost: engagement and exploitation are enabled when digital materials endure.

The greater the importance of digital materials, the greater the need for their preservation: digital preservation protects investment, captures potential and transmits opportunities to future generations and our own.[82]

At the University of Cambridge Library, the Digital Preservation Service was created in 2021, building on previous work exploring the digital preservation needs of the Universities of Oxford and Cambridge and the establishment of a Digital Preservation team in 2019. The Library's Digital Preservation Programme will use cloud and open-source software solutions to underpin activities that will enable current and long-term access to digital collection materials. These activities are embedded from when the digital files are first created or acquired, right through to when they are accessed, use, and re-used.[83]

2.6.3 Makerspaces

Makerspaces have been incorporated into some of the libraries and these generally either focus on rapid prototyping and design thinking or on digital media production, including video/sound studios, data visualisation spaces and AR/VR/AI applications development. The Makerspaces also vary in terms their level of integration with curriculum delivery, their recreational role in support of general student well-being and level of library staff support for the Makerspace.

The new Library at Notre Dame University Australia Fremantle will have several small, soundproofed rooms with a computer and a good camera that will be easy to use, flexible and easy to modify over time. They had considered creating a Media Production space in the Library, but this was removed from the design as similar facilities existed elsewhere on campus. There was also a concern that highly specialized media production facilities could rapidly become a 'white elephant' if the technology isn't renewed periodically or if staff can't provide the specialised support that is needed because they lack the necessary skills.

There are several recording studios in the Flinders University Library that were created for staff use but there are increasing requests from students for access to the studios. The University of British Columbia also has several recording studios in the DIY Media Studio that is in the Music, Art and Architecture Library. The Studio can be booked on-line and has equipment and software to record high quality video and sound.

The University of Sydney's Fisher Library has several 'one-touch recording' studios, and these are all very heavily used. Additional video and audio recording studios are provided in the CreateSpace facility in the Susan Wakil Health Building along with 3D printing, virtual reality headsets, electronics design kits and sewing machines. The use of the studios is increasingly embedded in the curriculum. Student nurses, for example, create podcasts as part of their assessment.

79 University of Wollongong
80 University of British Columbia Library (e)
81 University of British Columbia Library (e)
82 Digital Preservation Coalition
83 Cambridge University Library (b)

Recording studio. Createspace. University of Sydney Library[84]

Other Makerspaces in the participating libraries focused more on rapid prototyping and the creation of physical objects and/ or the development of augmented/ virtual reality applications.

The Makerspace at the University of Canterbury's Central Library is staffed by students and is generally used more as a recreational, craft-based space rather than as a formal learning space that directly contributes to academic programmes.

The Library's Te Rua Makerspace is where *"learning is made practical by applying a range of disciplines to explore ideas, solve problems and build things through making…Te Rua Makerspace encourages student and staff collaboration and relationship building between differing disciplines and fields of study to drive the creative environment….A selection of high and low technologies are made available to explore materials and ideas, create, craft, discover, invent, prototype, fabricate, innovate and tinker.*

Te Rua is also the perfect spot to take a creative break from your studies! Whether you want to decompress and play with Lego for 10 minutes or spend the whole day working on a personal project away from classwork, Te Rua is the place to be!"[85]

The lower ground floor of the Chinese University of Hong Kong Library has been refurbished to create the 'Learning Garden'. This large student-focused space includes a wide range of individual and collaborative study environments that have been designed to support diverse student needs.

The Learning Garden also includes a Makerspace, VR Lab, a Creative Media Studio, and a service desk that loans out VR Headsets, 3D scanners, cameras and other equipment that supports students creating digital content.

The Makerspace contains flexible prototyping and digital fabrication workspace with hot benches, laser cutters, 3D printers and scanners as well as high performance workstations, a UV printer, an embroidery machine and a range of Internet of Things tools. It also includes augmented and virtual reality applications and development tools.

The Creative Media Studio is designed to help students create high quality video content with no previous production experience required. Semi-enclosed booths, equipped with high performance workstations, support student video editing and 3D modelling work.

At RMIT the Makerspace is currently located outside the library because that was where space was available at the time to test the concept. The goal for the future is to include the Makerspace as part of the planned 'Digital Playground.'

84 University of Sydney Library (d)
85 University of Canterbury

VR Zone, Makerspace, the Chinese University of Hong Kong
Photo credit: The Chinese University of Hong Kong Library

"The City campus Library Makerspace is a place where you can explore your creativity, design and make stuff. We give you access to a growing selection of tools and equipment to help you experiment and problem-solve. While we provide some support, the idea is for you to learn by doing."[86]

When creating this Makerspace, the library felt it was important not to duplicate what is happening in the Faculties where there has been a huge investment in technology to support the delivery of the curriculum. The Library Makerspace cannot get involved in curriculum delivery as the sheer volume of students who will need to use the technology for projects would swamp the library.

Instead, the Library should provide a different offer that supports the University's clubs and societies as well as the wider community including local high schools. RMIT sees access to the Makerspace as an important part of their community engagement activities.

There are currently two Makerspaces in the University of Sydney Libraries, and a third one is planned. The Makerspaces generally contain 'lower end' equipment for student use which means that the more advanced Makerspaces in Engineering are used by students and researchers who need the advanced equipment. The Makerspaces are staffed by peer learning advisors who are post-graduate students.

The Makerspace at Curtin University occupies very visible space on the ground floor of the atrium space. It is used for both recreational use by students, supporting well-being and mental health, and as part of academic programmes with tutorials held in the space utilising the equipment.

Facilities in the Makerspace include 3D printers and scanners, laser cutters and fabrication equipment, sewing and embroidery machines, camera and recording equipment, digital media production, virtual reality technology, electronics and robotics, arts/ craft materials and hand tools. The Makerspace remains open over semester breaks as this is when students may have time to use facilities or learn new skills.

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86 RMIT University

Curtin University Library: ROGUE Augmented Reality Application

ROGUE is a location-based puzzle game launching in the refurbished TL Robertson Library during Orientation Week. Using their own personal devices, players assume the role of a system administrator to help Akiko – the Library's fictional artificial intelligence (AI) – fix suspicious errors in her system caused by an unknown entity. By working through puzzles and discovering information, place will uncover the truth and face a choice: who can they trust?

The vision board for The ROGUE narrative design thinking workshops, displayed in the Library Makerspace. Curtin University[87]

The Alternative Reality Game introduces players to important Library locations and the history of Library technology, and prompts users to problem solve, think critically, and connect with others. It is a non-linear story told through a variety of story forms, such as chat logs, news articles, audio recordings and physical items. ROGUE is played on mobile devices by individuals or teams of players who scan the QR codes found within the refurbished Library spaces and following the prompts. The game concept was developed in a series of design thinking sessions in the Library Makerspace involving staff from the Library, the Learning Innovation and Teaching Excellence Centre (LITEC) and the Hub for Immersive Visualisation and eResearch (HIVE).[88]

ROGUE has been very successful, particularly at Orientation week for new students or to introduce high school students to what is available in the Library. The game plays on big screens around the library, and this signals clearly to library users that there is a lot more going on that they might expect from a typical library.

The biggest problem the Library has had to deal with is that students steal the clues that are located around the building.

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87 Curtin University (b)
88 Curtin University (b)

Curtin University Library Makerspace[89]

The New Media Centre (NMC) at Delft University of Technology is the group responsible for lecture capture and streaming, teacher technology training and the provision video studios for staff and students.

"The NewMedia Centre (NMC) of TU Delft Library is a dynamic multimedia hub for media production, experimentation, research, education, live performance, and learning. We strive to use new media technologies and create media experiences that enable people to get their message across successfully and to help teachers, students, researchers and all employees of TU Delft with their media needs.

The NMC consists of a variety of creative departments from video to graphic design and from immersive technologies to digital events."[90]

The Centre is also the central point for VR/ AR activities in the university and it develops applications to support curriculum delivery. A recent project was for the Maritime Engineering programme where the class size had got too big to take everyone down to the harbour docks to work on projects there. The NMC created a virtual harbour and dock where groups of students can work together, and all view the same thing.

NMC has also created a spin-off company, supported by the Innovation Impact Centre of the University, to work on service delivery within the University and to work with external clients for the development of VR applications. Recent projects have included the development of surgical simulation VR applications used by the Medical School. NMC has grown from 10 to 30 staff, and they also hire students to manage lecture capture.

89 Curtin University (c)
90 Delft University of Technology Library (c)
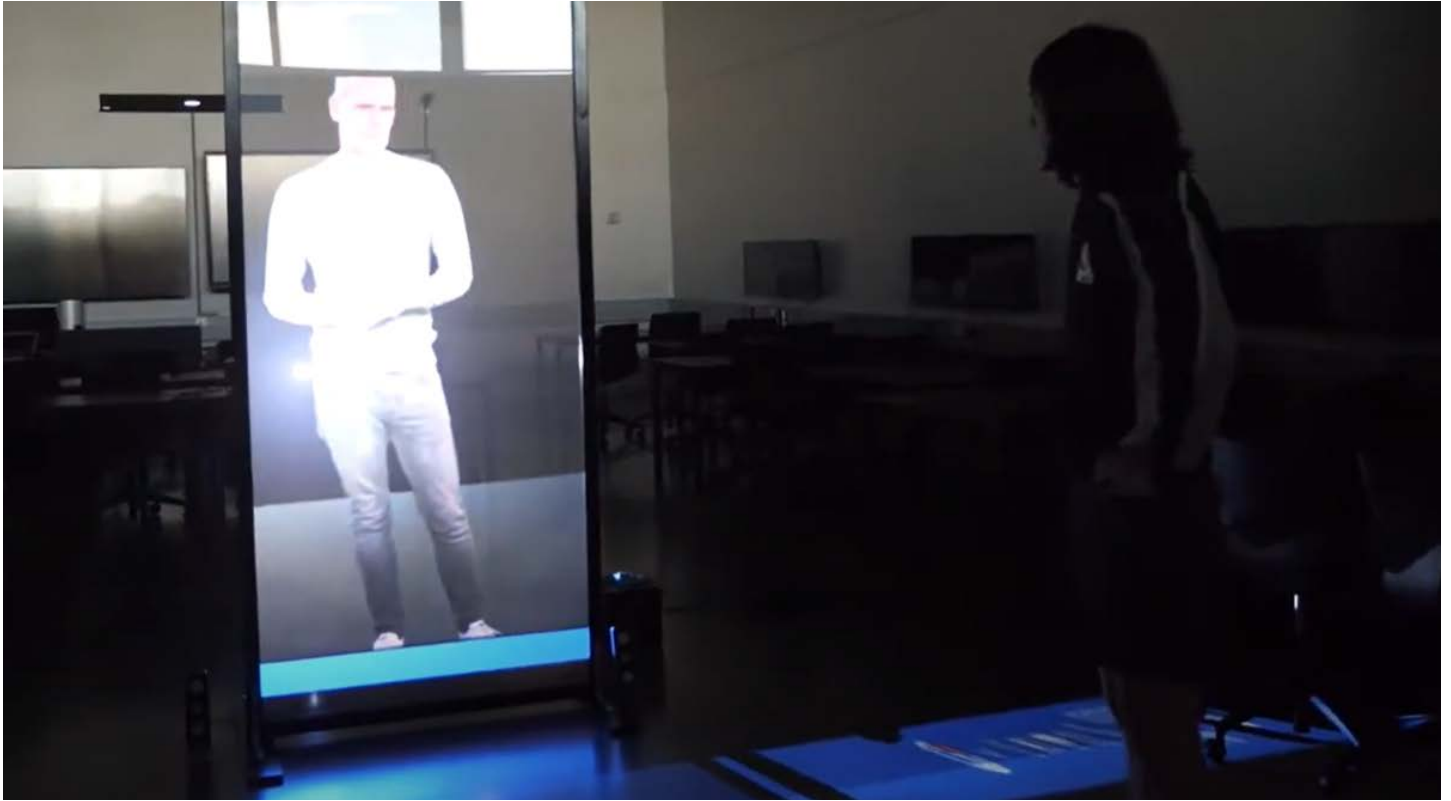
Delft University of Technology New Media Centre (NMC) project exploring the possibilities of holographic projections in the classroom.[91]

2.6.4 Digital Scholarship Centres

Joan K. Lippincott, Associate Executive Director of the Coalition for Networked Information noted in 2014 that an increasing number of universities and colleges are establishing Digital Scholarship (DS) Centres to support high-end digital projects that serve research, teaching, and learning. These centres serve an array of disciplines in the humanities, social sciences, and sciences. Most institutions have one Center serving all disciplines; a few offer separate, specialized centres for various disciplines; and some serve only a single broad area, such as the humanities.

DS Centres can build institutional capacity to address emerging and future scholarship needs. They provide a support mechanism for the growing areas of e-research and digital scholarship, bring together expensive technologies (and services to support their use) to serve the entire campus; and let students explore digital technologies in their research when such resources — whether technologies or advisory support — are unavailable in their departments.[92]

In a 2017 presentation to the Association of Southeastern Research Libraries (ASERL) Lippincott stated that there are two broad types of Digital Scholarship Centres on campus: 'Centre' and 'Institute' based DS Centres.

Centre-based DS Centres are generally administered by the library and receive their primary funding from the institutional budget. These centres partner with and offer services to a variety of disciplines and users and generally have a strong interest in life cycle issues – long term maintenance and management of the digital scholarship datasets and outcomes.

Institute-based DS Centres are generally administered by the Faculty or Institute and the primary funding for the Centres comes from research grants. The centres usually work on projects of the affiliated faculty within the defined discipline and the focus of the Centre is on answering new research questions.[93]

The University of New South Wales Library is currently developing plans for a Digital Lab for the Main Library and a space has already been identified where this will be located. The Library is currently exploring leading national and international Digital Lab spaces and services to develop ideas about what a multi-dimensional Digital Knowledge Lab should look like.[94]

The Library Makerspaces at the University of Sydney also include a range of spaces and technologies to support digital scholarship activities. Thinkspace, launched in 2016, is described as a 'technology showcase' and a 'creative play space' and it includes 3D printers, CNC router, video and audio recording studios and a video wall. The video wall is used for visual exhibitions, data visualisations and interactive displays.

91 Delft University of Technology New Media Centre
92 Lippincott et al (2014)
93 Lippincott (2017)
94 University of New South Wales, p. 7

"ThinkSpace is the Library's new creative space where students and staff can experience and try out new technologies, play and create. It is designed to be both a showcase for new educational tools and a place for students from across campus to mix, collaborate and develop innovative solutions to their projects."[95]

At the Chinese University of Hong Kong Library, the Digital Initiatives team sits and works alongside the Special Collections team. A significant proportion of the Special Collections have been digitised – some also using optical character recognition to facilitate machine reading of the collection – and the digitised collections are used for research and to support digital storytelling.

The Digital Scholarship Lab has been in operation for eight years and it is located on the ground floor of the Library. The 180sqm space comprises a computer cluster with high performance computers for data manipulation and a multi-purpose visualisation room with a large high-resolution screen for visualisation and events.[96]

The Digital Scholarship Lab is described as *"space for experimenting digital scholarship research, for cultivating potential research projects, and for fostering collaboration across different disciplines…the Lab brings together advanced equipment, specialist software, collaborative space and expertise to enable researchers to engage in their research and to conduct different research-related events and activities."*[97]

Services provided by the Digital Scholarship team include sourcing research data, the creation of digital content, consultation with researchers on the selection of digital scholarship tools and methods, data visualisation and meta data creation. The Centre also provides technology support for the creation and maintenance of online platforms such as websites for the dissemination of research deliverables.

Digital scholarship research tools and methodology workshops and seminars on a variety of topics are offered during every academic term to assist researchers to acquire new knowledge and skills.

The Digital Scholarship team works with staff and students on a wide range of digital scholarship projects each year. The Library also provides students with opportunities to explore data mining, data analytics and visualisation through the re-use of real data and meta data from the university and Library collections.
A recent project, for example, worked with 800 digitised Chinese recipes written by Wang Ang in 1682 to analyse the 230,000 Chinese characters and extract statistical information about the use of ingredients among the recipes.[98]

The plans for the new Main Library at the University of Bristol include the creation of the Centre for Cultural Collections on the ground floor of the new building. This Centre will include a 'Wet to Tech' Makerspace including a fully operating printing press and the latest VR/AR creative technologies via various forms of media archaeology. The activities will be delivered and operated by library teams in partnership with various academic units, including the Media Archaeology Unit and the Centre for Innovation and Entrepreneurship.

The Centre for Cultural Collections will be completely open to the public, including the Creative Lab and Makerspace, an events space and two exhibition galleries – including one which supports student and community co-creation of exhibitions and virtual museums, alongside 'traditional' reading and seminar rooms. There will also be dedicated studios for the digitisation of 2D and 3D objects, sound, and audio-visual content. The long-term digital preservation of the cultural collections is part of the University's approach to managing its research data. The Arts and Humanities Research Council (AHRC) and Research England have provided funding to support the development of the research infrastructure, including investment into digital creative technologies and community engagement but they did not directly fund the Centre for Cultural Collections or its constituent spaces.

In a 2021 article on Bristol 24/7, Jo Elsworth, Director of Cultural Collections (Library Services) and the Theatre Collection stated that:

"The Centre for Cultural Collections will sit at the heart of the new library and will provide free publicly accessible reading and viewing rooms, exhibition spaces and associated events and activities, alongside secure collections storage and conservation, digitisation and creative labs. Most importantly, it will provide a platform for us to work collaboratively, establishing and scaling up relationships with community partners and cultural organisations across the city."

The Research Commons in the Koerner Library at the University of British Columbia includes the Digital Scholarship Computer Lab. The Lab provides expertise and support on a wide range of digital scholarship areas including data analysis and visualisation, citation management, research data management and geospatial information and technology. The Lab describes itself as "a community space that embraces both new and traditional exploratory scholarship and provides access to services and expertise for the advancement of research."[99]

95 University of Sydney (b)
96 Chinese University of Hong Kong Library (c)
97 Chinese University of Hong Kong (d)
98 Chinese University of Hong Kong (e)
99 University of British Columbia (b)

The UBC Library Research Commons includes 18 enhanced PC workstations (11 on-site, 6 short-term, remote-access, 1 long-term, remote access) to support data, GIS, and research projects that require enhanced computing power.[100]

The Library has hired librarians to support digital scholarship and data analytics in the library. One position is 75% Digital Scholarship support, 25% liaison librarian and the second is 25% Digital Scholarship, 75% liaison librarian to provide some resiliency and avoid having a single point of failure.

The Irving K. Barber Learning Centre at the University of British Columbia also houses the Emerging Media Lab (EML). This Lab is a Faculty-based Media Lab but it is located in the Library. The Lab's mission is to *"evolve learning by creating tools and techniques using emerging media including Augmented, Mixed, and Virtual Reality."*[101]

The EML consists of two rooms: a public multi-station lab and presentation space and second room that can be used as a meeting room, demonstration space or development area. The Lab is open 9am-5pm on weekdays and is open for questions from students and faculty as well as offering lab time for classes and faculty members and regular demonstration sessions. The EML is staffed by student employees and some of the Centre for Teaching, Learning and Technology's student Learning technology Rovers.

At the time of the opening of the new EML space in the library in 2019, Julie Mitchell, Assistant Director, Student Engagement at the Irving K. Barber Learning Centre stated that the *"implementation of an Emerging Media Lab is a natural fit for UBC Library….Challenging traditional views of libraries as repositories for the printed book, leading academic libraries are at the forefront of providing technology-enabled spaces to support learning and research. The EML@IKBLC project was a priority for the Irving K. Barber Learning Centre as it creates space for interdisciplinary interactions and provides tools to explore new technologies, with the potential to transform education and research practices at UBC."*[102]

The location of the EML in the Library was seen as a significant benefit. As a central, shared space on campus, it was felt that faculty from across the University would be more likely to use the Lab than if it was embedded within a Faculty or Department.

The Simon Fraser University Library Media and Maker Commons is located in the W.A.C. Bennett Library, and it is described as a collaborative, hands-on learning space. The facilities there include 3D printers and scanners, a laser cutter, sewing and embroidery machines, a letterpress, a video studio and a VR studio.

Emerging Media Lab (EML) at the University of British Columbia[103]

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100 University of British Columbia Library (f)
101 University of British Columbia (g)
102 University of British Columbia (g)
103 University of British Columbia (g)

"Whether you are working on your research, coursework, or a personal project, the SFU Media and Maker Commons will provide you with space, services, tools, and training to make, create, prototype, and play."[104]

The use of many of the facilities in the Media and Maker Commons is closely integrated with the curriculum. The 3D printers, for example, are used as the lab space for the TEKX 101 course (Introduction to 3D printing and laser scanning technologies) and the antique letter press is used by the University's publishing programme and the Print Culture Group in the English Faculty.

The Digital Humanities Innovation Lab (DHIL) is housed elsewhere in the W.A.C. Bennett Library. The Lab is an incubator for digital humanities projects and *"assists SFU researchers with the development of digital scholarship by providing consultations, training, mentoring, research software development, and technical support...the DHIL leverages the Library's expertise in digital initiatives, unique special collections, and research skill-development programming."*[105]

The DHIL awards micro grants to projects across the university, providing researchers with access to programmer support and digital humanities project management. These small projects are often used by researchers as proof of concept to support their applications for larger grants from Federal Research Funds.

The micro grants offer researchers *"opportunities to undertake small-scale exploratory research with support from members of the DHIL team (up to 10 hours per researcher per semester). This work might involve identifying best tools or methods for your digital research, working with an API, assistance with data visualizations, data collection methods and markup, or working with a new digital tool or publishing platform, etc."*[106]

A problem that the Library has faced, however, is that it may get involved hosting the digital humanities applications or data sets being used by the researchers but there may be no funding available for the long term maintenance or upgrading of the application once the project funding is finished. To ensure the sustainability of the digital humanities project the Library now hosts fewer projects and endeavours to do it better. The Library no longer runs its own data repositories as they are expensive and time consuming to manage and there is a robust Federal Research Data Repository available so it is better to use this.

Media and Maker Commons, Simon Fraser University[107]

104 Simon Fraser University Library (d)
105 Simon Fraser University Library (c)
106 Simon Fraser University Library (e)
107 OMB

Summary

The provision of data scholarship services and spaces within the libraries in this study varied widely. Many libraries are focusing on 'below-the-waterline' digital scholarship activities such as research support, data repository management, meta-data development, open access publishing, digitisation and the management of the library's digital collections.

Other libraries have created Digital Media production spaces/ Makerspaces including video and sound recording studios and editing facilities to support both faculty developing on-line learning resources and students creating video or podcasts as part of course assessment or dissemination of research activities. Spaces to support augmented and virtual reality applications development may also be part of these media spaces.

Other Makerspaces included equipment for craft activities and/ or rapid prototyping including antique letter presses, sewing machines, 3D printers, electronics and robotics kits and CNC routers. The Makerspaces may be used for both student recreation and to support the delivery of academic courses.

Digital Scholarship Centres – bringing together expertise and advanced technology – are still not common in the libraries that participated in this study although the opportunities for creating a more visible hub for digital scholarship activities is being explored by several of the libraries.

Concerns were raised about the duplication of digital scholarship spaces in the library with other similar facilities located in the Faculties and about the capital cost and ongoing running costs associated with dedicated Digital Scholarship spaces as well as the requirement for new skills within the library workforce. These concerns can, to some extent, be mitigated by partnering with other University departments or academic units to co-create and manage these spaces.

The library – as a central, shared space on campus – was seen to be a good location for a Digital Scholarship Centre as it increased access to expensive resources by students and researchers from across the university and beyond rather than limiting use to the Faculty of College that 'owned' the Digital Scholarship technology and resources. The creation of a high-profile Digital Scholarship Centre within the library could also act as an attractor for both students and faculty and provide opportunities for additional research funding for interdisciplinary projects.

Key Findings:

1. Most libraries are engaging in 'below-the-waterline' digital scholarship activities such as research support, data repository management, meta-data development, open access publishing, digitisation, and the management of the library's digital collections.

2. Interest in the ability to showcase digital collections with visual platforms to allow the works to be displayed and interacted with.

3. Increasing focus on AI by libraries to provide support and education in the use of AI for study and research and investigate the potential of descriptive AI analytics.

4. Increasing digitisation of Special Collections and University Archives, often requiring the creation of digitisation studios with a specialised scanning equipment.

5. Library Makerspaces are typically not linked to the curriculum (providing anything from 3D printing, virtual reality, electronics kits, sewing machines, to printers and more) and are often focused on informal learning and innovation rather than duplicating curriculum-based Makerspaces provided in faculty.

6. Increasing student and staff requirement for recording/media production studios and digital media production facilities which support audio, visual as well as data visualisation.

7. Digital innovation in research is typically compartmentalised across campuses in different faculties with little cross-disciplinary sharing and coordination of activity. There is increasing interest in the development of Digital Scholarship Centres to stimulate and coordinate the development of innovation in digital scholarship and centralise access to experimental equipment and technology.

8. Concerns by libraries about cost of creating and managing a Digital Scholarship Centre within library budgets and requirement for additional staff with advanced digital skills to run the Centre.

2.7

Creating an inclusive and welcoming library experience.

The libraries in this study all had the support of their learning community at the heart of their mission. There was widespread recognition that the study landscape within the library had be inclusive, welcoming and safe for all students and this was reflected in some libraries by the creation of dedicated spaces for First Nations students and for students who identify as neurodiverse, disabled, LGBTQ+ etc. Other libraries aimed to make all spaces within the library welcoming to all and provided a diversity of study settings to meet all needs while providing several neighbourhood spaces, combining collection and study space, that create gathering spaces for specific student communities.

The first obstacle to the creation of a welcoming and inclusive place for all students – as well as the wider community – may be the building itself. As RMIT noted, the building itself can be intimidating for many people as they don't know whether they are allowed in the building or can use the resources. The University of Tasmania agrees and took the opportunity offered through the design of their new Inveresk Library to make the building more welcoming to all communities by creating entrance ways that are more porous and engaging. For example, a permanent exhibition of Tasmanian Aboriginal cultural material and video stories is displayed at the entry, developed by a local Aboriginal reference group.

The University of Melbourne Library stated that the library should consist of a series of permeable spaces where there is a strong visual connection between the spaces. The entire journey to get to these spaces should be considered, right from the entrance of the building, to ensure that there are no barriers or ambiguities about the routes through the building.

The University of Waikato Library is contributing to the university's intention to be the first anti-racist institution in Aotearoa. All spaces in the library need to be inclusive and welcoming to everyone – creating a landscape of spaces that meet everyone's needs.

Flinders University Library has found that there are increasing demands for dedicated and branded spaces in the library to support student diversity, however they also feel that a better solution is to ask how they can make the whole library a culturally safe space.

Flinders University, like many of the libraries participating in the study, are also greatly concerned about the physical safety of students alongside cultural safety. Several Australian universities mentioned the NUS survey that found that around 15-20% of complaints about harassment or assault of students on campus were associated with libraries.[108]

To improve safety in the libraries, several of the libraries in the study were using the opportunities provided by the reduction in the physical book and journal collections to reduce shelf heights and improve sight lines and lighting within the library. The presence of library staff, student support and security staff during extended opening hours also provides additional comfort to students using the library.

The Delft University of Technology Library, on the other hand, is widely viewed as a safe space by students. A recent survey found that students, many of whom are refugees, rated the library as their 'Number One Safe Space' in the city and scored it even more highly than their faculty spaces. The library was seen to be a space where the students could be themselves and not feel the direct academic pressure that they felt when in the Faculty spaces.

Creating culturally safe and welcoming spaces is not just about the physical space, it is also related to how these spaces are used. The University of Sydney noted that the library can appear alien and confronting for equity students and they may feel excluded. To counter this the library holds events and activities for new students, including weaving workshops in the library run by an Indigenous owned and operated business. They have also commissioned several digital art pieces for the library, created by Indigenous artists, that acknowledge Gadigal Land. These are generally well liked as they are calming and welcoming.

The University of Canterbury Library also strives to make the library more inclusive and welcoming to all parts of the student and staff community. They acknowledge, however, that the size and configuration of their atrium, the choice of materials, light levels, the signage, and the general levels of activity in the library can be problematic for neurodivergent students and staff.

Their current large central circulation desk is simultaneously imposing and confusing with multiple service points and layers of signage. Until reconfiguration of this space is possible during a future refurbishment project, the library staff make a major effort to come out from behind the desk and individually welcome students when they enter the library during the first few weeks of the academic year to reinforce the message that the library is about people not just books.

The University of Bristol is taking deliberate steps to ensure they are creating an inclusive and welcoming community for an increasingly diverse student population. The Library will continue to have an important role in supporting students from all backgrounds and representation of the diverse student and staff communities in the planned new Library is seen as an important element in making the library welcoming and inclusive.

108 Social Research Centre (2022)

2.7.1 Supporting First Nation students

Support of Indigenous cultures varied widely across the libraries in the study, ranging from the inclusion of Indigenous artworks within the library, the renaming of the library and library spaces through to decolonisation of the library's collections, the employment of Indigenous library staff to support the Indigenous collections and decolonisation initiatives and the creation of dedicated First Nations spaces. Other libraries aimed instead to make all areas of the library welcoming and inclusive to First Nations students rather than creating a dedicated space for these students.

The University of Canterbury Library acknowledges that the library is a Western institution and must evolve its spaces and the way it delivers its services to welcome Māori and Pasifika students. To help achieve this goal the Library has created posts for three Māori specialists who support students and help them to succeed with their study at the university.

In terms of their Library spaces, work is underway or planned to make the spaces more welcoming. Most of the Māori and Pasifika collections are in the Macmillan Brown library and these can only be accessed in very traditional library reading rooms. Some design work is being undertaken in the Central Library to introduce Māori design motifs in the central services area, but a more comprehensive re-thinking of the Library spaces will be part of the future Library refurbishment project.

Te Tumu Herenga | Libraries and Learning Services staff at Waipapa Taumata Rau | University of Auckland now includes several Māori and Pasifika cultural leads, and new library projects include a greater level of engagement and co-design with Māori and Pasifika students and staff.

Co-design with the Māori and Pasifika students as well as the local Iwi was also a fundamental part of the design process for Massey University's planned new Library. The cultural brief that emerged from this process included consideration of how the Māori and Pasifika collection study spaces could be designed to make students feel they belong and are comfortable. This includes space in the building for preparing and eating food, music and group working. In future projects the library intends to take the co-design process further to embed Māori values and knowledge in every part of the library, including both spaces and how they deliver their services.

At the University of Wollongong Library staff are engaged in a widespread programme of work around the support of Indigenous students, including a review of collection descriptions and meta data to ensure that they are culturally appropriate. In terms of the design of library spaces, they intend to work closely with students and the local community to ensure that Indigenous ways of knowledge are represented. The Library are also participating in the Jindaola Program that seeks to embed Aboriginal ways and knowledge into the curriculum and the core library functions of collection development, discovery and access.

University of Otago Ōtākou Whakaihu Waka

The University's Strategic Plan to 2030[109] notes that Māori and Pacific enrolments have risen steadily in recent years and over 30 per cent of students are first generation university attendees. While the university currently has one of New Zealand's best paper pass rates and qualification completion rates for Māori and Pacific students key educational performance metrics for these groups as a whole, remain significantly below those achieved by the broader student population. The university has identified the need to prepare now to ensure that by 2040, the student body is reflective of the reality that 25.0% of New Zealand's population aged 15-39 will be Māori, and 13.8% will be of Pacific ethnicity.[110]

The library has created a new set of roles to lead the development of their support for Indigenous students and staff. New roles include: Associate University Librarian (Māori and Strategic Development), Head Curator Māori for the Hocken, Māori archivist role, Pacific Engagement advisor and Māori Engagement advisor. The goal is to attract more Māori and Pacific Island library users and make them feel welcome. More representative Māori and Pasifika staff numbers will also be an important step. The library has not reached the critical mass of staff that will be sustainable in the longer term but they are working towards definite targets that will achieve this.

Major collection management initiatives are also underway to describe, collect, conserve appropriately and prioritise importance of collection items through community liaison.

The priority is to understand how the whole library can support the vision rather than about creating a dedicated space for Māori and Pasifika students. The whole library space should allow people to be who they are. It is recognised that this will be a challenge given the limited amount of space available.

109 University of Otago (a)
110 University of Otago (a), p. 23

Monash University Library is undertaking a range of initiatives that align with Monash University's commitment to fostering a society that recognises, respects, and includes Indigenous peoples, cultures, and knowledge. These are intended to deepen cultural competencies and awareness of cultural inclusivity within the Library's services and collection. The Library supports staff on their learning journey to become culturally competent and understand the 'why' to doing this work through engagement with the Core Cultural Learning: Aboriginal and Torres Strait Islander Australia (Core) Foundation Course developed by the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS). It is strengths-based and encourages people to understand their cultural perspectives as the basis for effective interactions with people of (other) diverse backgrounds.

At the RMIT Library the immediate priority is the decolonising of the library's collections. Rather than simply displaying First Nations artworks, the library is aiming to embed Indigenous knowledge and ways of doing things into everything they do, and to activate library spaces with events for First Nations students.

To support this, the library has strong relationships with First Nations activities in the Colleges and is a partner in the delivery of the University's Reconciliation Plan.

Deakin University created its first dedicated First Nations study space in the Library in 2022.

"Named Marrang, a Kirrae Whurrong word meaning 'great meeting place', the room is located in the Warrnambool Campus Library and is intended as a space for work, study, meetings and more."[111]

This includes a lounge area, large desk with six study chairs, computer, data projector, Indigenous artworks and access ot the Koori Mail newspaper.[112] The Koori Mail is an Australian newspaper written and owned by Indigenous Australians since 1991.[113]

The University of Adelaide Library's First Nations spaces - Yaitya Ngutupira – are spaces and collections of physical and digital items from across the Library, brought together on the themes of linguistics, art, native title, health, social justice, politics, and biographical and cultural knowledge.

Yaitya Ngutupira, University of Adelaide's Barr Smith Library.
Source: Andrew Harrison

111 Deakin University Library (b)
112 Deakin University Library (c)
113 Koori Mail

Yaitya Ngutupira comes from the Kaurna language, meaning about Aboriginal knowledge. Yaitya Ngutupira spaces are located at all three University campus Libraries.

The collection aims to highlight and present books written by Aboriginal and Torres Strait Islander authors and scholars and the space is for anyone who wants to immerse themselves in Aboriginal and Torres Straits culture and tradition create ways to meet, engage and share knowledge.[114] The Yaitya Ngutupira space in the Barr Smith Library is currently being expanded to include a Yarning Circle and large digital screen that will display scenes of Country – creating an immersive experience for the users of the space.

In 1993 the First Nations Longhouse and the Xwi7xwa Library were opened at the University of British Columbia. Xwi7xwa Library is the only Indigenous branch of an academic library in Canada. The building is designed after structures built by Interior Salish Nations.

"In the Chinook Jargon language it is called a Kekuli, in English it is called a pit house, and in Ucwalmícwts (Lil'wat nation) it is called a S7ístken…… Although our roofs exposes, roofs are normally covered with bark, earth, grass, and needles. The hole at the center allows smoke to escape from the fire inside. The central pole is used as a ladder to enter and exit but visitors are unable to use this feature with the absence of notches to ensure proper footing. Our branch is 198 square metres and half subterranean. Within, patrons have access to our collections, archives, computers and other technology equipment, and a gender neutral washroom."[115]

It is a centre for academic and community Indigenous scholarship. Its collections and services reflect Indigenous approaches to teaching, learning, and research. The collections currently comprise approximately 12,000 items and focus on First Nations in British Columbia, including contextual materials on Canadian First Nations, in addition to issues of national and international interest to First Nations and Indigenous Peoples. Xwi7xwa collects materials written from First Nations perspectives, such as materials produced by First Nations, First Nations organizations, tribal councils, schools, publishers, researchers, writers and scholars.[116]

University of British Columbia Indigenous Strategic Plan

The University has an Indigenous Strategic Plan[117] that seeks to ensure that a greater number of Indigenous students have access to a full range of educational opportunities and that embedded colonial biases throughout the system are addressed. Curricula and research projects on matters of concern to Indigenous Peoples and communities should be co-created and the University must contribute to a better and broader understanding of Indigenous history and Peoples, and the legacy of colonisation.

GOAL 5 of the Indigenous Strategy is Enriching our spaces - Enrich the UBC campus landscape with a stronger Indigenous presence. The actions within this goal include:

Action 19. Engage with Musqueam, the Okanagan Nation and other Indigenous host nations, as appropriate, regarding the design and development of UBC facilities.

Action 20. Establish a cultural expert program that brings Musqueam, Okanagan Nation and other interested nations' cultural experts and Indigenous knowledge holders to the UBC campuses to work, teach and promote their expertise.

Action 21. Dedicate spaces for Indigenous students, faculty and staff to practice and celebrate their cultures.

Action 22. Identify and make visible the generational connections of Indigenous Peoples to culturally significant places across UBC campuses.

Action 23. Implement an Indigenous procurement strategy which prioritizes the provision of goods and services from Indigenous businesses and vendors.

Source: UBC Indigenous Strategic Plan 2020

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114 University of Adelaide (b)
115 University of British Columbia Library (h)
116 University of British Columbia Library (i)
117 University of British Columbia (c)

The library uses a British Columbia variant of the Brian Deer Classification System (BDCS), developed by Kahnawake librarian Brian Deer in the 1970s for the National Indian Brotherhood (now the Assembly of First Nations). One of the advantages of the BDCS is that it is designed for flexibility to reflect local Indigenous communities and the unique collections of individual institutions. However, it is only a high-level classification system and not a subject headings system. As there are no standards or guidelines for implementing BDCS, there can often be inconsistencies within and between collections.[118] UBC Library and the Xwi7xwa Library faculty and staff are currently working on further development of the classification system to better reflect the collections and the information needs of the students and faculty.

As part of its support of Indigenous students the University of Melbourne has implemented a strategy focusing on 'reconnecting with the land.' The recently released Indigenous Plan[119] will further expand on this work across the university and implement Indigenous design principles within its Capital Works projects. Within the existing masterplan for the central campus a lot of work has been done to re-establish precinct and implement Indigenous design principles. During the refurbishment of the Engineering Library and the surrounding area, for example, the building was excavated to reach the level of the historic creeks and rivers in the area. The design of the library refurbishment worked with this understanding of the landscape and history of the site to create a design based on 'below the river', at 'river level' and 'above river level.' As the University web page announcing the re-opening of the library in 2021 states:

"Connecting the library to Country, the Indigenous creek narrative featured throughout the Precinct is represented in the library's ground floor design via 'creek-let' inspired seating. Through their unique shape and colour, these seats represent the tracing of an 'original' watercourse that traversed the site.

Carpet designs throughout the upper levels of the ERC Library reflect local Indigenous culture, native flora and fauna and international themes, while a series of artworks displayed throughout the building draw inspiration from the University's Archives and Special Collections, celebrating the seldom-seen treasures held in these collections."[120]

External spaces were also considered by Notre Dame University Australia as part of the library refurbishment project. A hard landscaped external courtyard adjacent to the library was not well-used. The intention through the refurbishment project is to create an outdoor living room for the whole university, greening the space with appropriate local flora.

The university and library worked closely with the traditional owners of the land to understand its value and cultural meaning. The space was historically a meeting point for Aboriginal groups who all spoke different languages. The intention is to create a Yarning Circle by the entrance to the library that will be an important cultural space for Aboriginal students, but it will also be usable for other university and community events.

Study spaces for First Nation students at the University of Notre Dame Australia are provided in an adjacent building to the library. From the library's point of view this is not a good solution as there is still a risk that First Nation students will feel like 'outsiders' who are not welcome in the library. The library wants to bring them into the library and make them feel that it is their space as well. To help with this process First Nations artworks will be displayed in the library and there will be dual naming of rooms and spaces in the library.

The University of Canberra Library has incorporated Indigenous elements where possible in the design features of our recent refurbishments of the Library. As Gail Heinrich, Associate Director, Library and Study Skills noted:

"This conscious embedding of the University's Reconciliation Action Plan priorities into all refurbishment plans for the Library celebrates the rich history and culture of the Ngunnawal people and all Aboriginal and Torres Strait Islander nations, while creating a culturally safe study space for the University's Indigenous students and enhancing cultural awareness across the broader University of Canberra community."

The University of Canberra's Ngunnawal Plant and Education space, Ngaladjima is located on the north side of the Library. Ngaladjima was created in 2019 and the garden is filled with varieties of vegetation significant to the Ngunnawal people. Each plant is accompanied by a sign detailing the plant and its uses. It has since been used as a space for ongoing plant-use education and Yarning circles.[121][122]

During the refurbishment of the Library, the project architects were sent information about the plants in Ngaladjima and the design palette for the refurbishments was based on colours of key plants, helping to "bring the outside in."

In addition, the Library was given permission to use the University of Canberra's Indigenous Treatment for feature carpets throughout the Library and for manifestations on glassed walls of study and staff spaces. All patterned upholstery for furniture and all new carpet in the refurbishment also have Indigenous designs and several significant Indigenous artworks have been acquired for the Library.

118 University of British Columbia (j)
119 University of Melbourne (d)
120 University of Melbourne (e)
121 University of Canberra (b)
122 University of Canberra (c)

"The UC Indigenous design treatment echoes the significant place and role that the Indigenous treatment incorporates an artwork painted by Lynnice Church, a Ngunnawal/ Wiradjuri/ Kamilaroi artist. It reflects the importance of forming strong partnerships and working hand-in-hand with the community to achieve lasting impacts.

Each element within the design uncovers integral parts of the UC story that celebrates diversity and inclusive relationships. Through this approach, UC acknowledges the principles of respect, trust, diversity, unity, collaboration, innovation and celebrating the inclusive future the University is building together with Aboriginal and Torres Strait Islander peoples."[123]

At Simon Fraser University the goal is to make all spaces welcoming and inclusive and to engage with students outside the library to deliver services and build relationships. While there is an Indigenous Curriculum Research Centre in the library, it is designed primarily for instructors.

The Indigenous Student Centre is located outside of the library and is popular with First Nations students who can 'let their hair down there and don't feel they are being watched there.'

The Indigenous librarian goes out to the Study Centre regularly to build relationships with students there and a library classroom is booked out for the students to use to study in after the Study Centre closes. Other library staff go out to meet with other communities including LGBTQ+ groups and the Women's Centre. This is illustrative of the library's belief that a decolonised institution is not about space – it is a series of services that can be taken out into the community to give people access to what they need.

University of Canberra Library Level C student study space.
Photo credit: University of Canberra Library

123 University of Canberra (d)

Lincoln University: Ngā Kete e Toru

The University's strategy is to provide a bicultural experience for staff, students and stakeholders and encourage the use of Te Reo Māori on campus. Ngā Kete e Toru is a specialised collection and study space in the library designed to bring together core Māori material into one place to reflect the holistic nature of the Māori knowledge world.

Ngā Kete e Toru refers to the traditional three kete or baskets of knowledge brought to earth by Tāne.

Kete-aronui which held all the knowledge that could help mankind.

Kete–tuauri which held the knowledge of ritual, prayer and memory.

Kete–tuatea which contained knowledge of evil, which was harmful to mankind.

The kete includes books, serials, government reports and multimedia resources with significant Māori content. Highlights include contemporary Māori magazines and journals, Waitangi Tribunal reports, and Māori newspapers on microfiche. Strengths of the collection are in: Māori planning and development; natural resources and environmental management; tourism and recreation; and science/bio-protection.[124]

Te Waihora, a mixed-media mural presented to Te Whare Wānaka O Aoraki by Te Taumutu Rūnanga in recognition of the 2008 Memorandum of Understanding between them[125]

The area includes a Taonga space where food is not allowed and several significant art works by Māori artists. Events can be held in the Ngā Kete e Toru space and the procession for Ra Whakamana Māori graduation has started from this space.

A new staff position is being created to support the use of the Māori and Pasifika collection and make connections with the Iwi and the wider community.

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124 Lincoln University (a)
125 Lincoln University (a)

Summary

Creating an inclusive and welcoming library requires more than just the provision of dedicated spaces to support specific groups of students. All aspects of the building should be considered including the overall building form, the choice of materials, the entry experience, the zoning of spaces and the provision of a rich landscape of study and social settings that will enable all students to find a place where they are comfortable and that meets their needs at that point of time.

An inclusive library is also more than just a collection of spaces. The collections management work that the libraries are undertaking including the acquisition of representative and inclusive physical and digital collections, the decolonising of the collections and the display and interpretation of items from the collection can all signal clearly that everyone is welcome in the library and that Indigenous knowledge and culture is valued.

The events that are held in the library are also an important element of an inclusive library – welcoming new students into an unfamiliar environment and engaging with diverse student and external communities through events, performances, and exhibitions.

Key Findings:

1. Current focus on decolonisation of collections, review of collection presentation, descriptions and meta-data to ensure that they are culturally appropriate.

2. There is general recognition of the importance of engagement with the Indigenous community to better understand their needs and ensure that Indigenous culture and ways of knowledge are appropriately represented throughout the library.

3. Increased use of co-design processes spaces with Indigenous community leaders, designers and artists to support design of new library buildings and spaces.

4. Establishment of new roles for dedicated Indigenous staff and establishment of cultural expert programs.

5. Creation of dedicated First Nations study spaces or Indigenous-focussed neighbourhoods within the library incorporating collections of physical and digital items from across the library, brought together on the themes of linguistics, art, native title, health, social justice, politics, and biographical and cultural knowledge.

6. Alternative approach being taken by some universities is to aim to make all library spaces inclusive and welcoming rather than the creation of dedicated First Nations spaces.

7. Creating an inclusive and welcoming library is more than just about space - library activities and events led by Indigenous students or staff are needed to activate the spaces and welcome the community into the library as well as the use of artwork and cultural artefacts designed by Indigenous artists.

Engaging with the community.

Library strategies often include statements about inclusion, widening access to the library and engagement with the local community, building on the mission, values and strategic priorities outlined in the overarching university strategies. Strategies to enhance community access to the library's Special Collections and the First Nations resources and artefacts are often highlighted.

To inform their future strategic direction, Deakin University Library undertook a co-design project that included students, academics, alumni, professional staff, library staff, community members and other external partners.

"There was a strong desire for the Library to move beyond being the 'passive' heart of the campus. From a space for deep individual scholarship, towards being a more active driver of discovery, debate and discourse, that enables students and the broader community to engage with Deakin research and researchers in new ways. Stakeholders described the future Library as being a 'centre for ideas', a 'living lab', and 'one stop discovery hub'. Somewhere that is less about consumption of existing resources and more about enabling active interaction with experts, outside of the classroom, to expose students and the broader community to new and different ways of thinking.

The future Library was imagined as a knowledge making space, not just a knowledge finding space. The future Library was imagined as a shared resource for not just Deakin students and staff, but for community, alumni, and industry. The Library could become an active collaborator and facilitator of collaboration, by bringing people together to exchange and interact with ideas, technology and each other."[126]

The Library also planned to expand its role as an intellectual and cultural institution by showcasing the University's unique and valuable collections and scholarly outputs through innovative exhibitions and public programming.[127] Future library spaces (both digital and physical) will be designed to promote accessibility, engagement, inclusion and cultural safety.[128]

The physical form that this widening access and enhanced community engagement takes in the library is, to some extent dependent on the nature of the university and the location of the libraries. Urban universities may be more closely connected and integrated with the surrounding community, perhaps sharing cultural and sports facilities, compared to suburban and rural campuses with discrete, bounded campuses that may not be so easily accessed by the community who may not feel that they belong on the campus or in the library.

At the University of Technology Sydney, for example, the campus is porous with seamless integration between campus and the surrounding commercial, industrial and residential buildings. Casual visitors to the campus tend to stay around the food court and informal study areas on the lower floors outside of the library but over time the public have discovered the Library and it has increasing engagement with the public through major city events such as the Library's Creative in Residence program and Vivid and South by South-West (SXSW) Festivals. Preferencing study spaces for use by students in a city where space is at a premium, while remaining a public institution, is a difficult balance for the Library.

At the University of British Columbia, the main Vancouver campus is 400 hectares in size and is surrounded by forest on three sides and the ocean on the fourth. It is a 30-minute bus ride to Vancouver's downtown core.

"Approximately one-quarter of UBC's land is used to create a vibrant residential community that supports the University's academic mission. This includes the things that make the campus a great place to be—community centres, grocery stores, child care, and more. It also includes rental and ownership housing for the UBC and broader community."[129]

The University's Strategic Plan 2018-2028 notes that community building needs to occur across both physical and digital spaces.

"Virtual spaces will play an ever-more integral role, and UBC will continue to evolve and strengthen its digital environments. In addition to stimulating collaboration, innovation and community development, these 'hubs,' will demonstrate UBC's commitment to inclusion and civil discourse, and will nurture an increased sense of community.

Well-conceived spaces are also needed to drive and enable interaction within and between our campuses and learning sites and with the broader community. As part of this strategy, we will work with partners on the development of UBC's downtown Vancouver and regional presence, recognizing that many people live and work beyond easy reach of our campuses."[130]

126 Deakin University Library (a), p.10
127 Deakin University Library (a), p.17
128 Deakin University Library (a), p.19
129 University of British Columbia (e), p. 9
130 University of British Columbia (d), p. 41

The University of British Columbia Library's Strategic Framework outlines how the library will support the delivery of the University Strategic Plan:

"The Library will actively foster opportunities for meaningful engagement and knowledge exchange with campus and community partners.

- *Strive to make resources accessible for all*
- *Enrich the quality of life for local communities*
- *Encourage the pursuit of lifelong learning*
- *Develop and strengthen mutually beneficial partnerships*
- *Promote the Library's stories, achievements, and value*
- *Collaborate with Musqueam and other Indigenous communities to co-develop knowledge and act on their wishes to steward materials in our care."*[131]

Simon Fraser University's Vancouver campus is in the Central Business District, adjacent to a very poor area with major drug problems and many homeless Indigenous people. The University is committed to maintaining the Library as open to the community and to enable this the Library has hired a former Public Library Director as the Head of the Vancouver Campus Library, with public engagement and community support being priorities for development.

2.8.1 Engagement with schools

Many of the libraries that participated in this study welcomed high school students who wanted to use the library study spaces for homework or exam study and school students are often able to borrow books from the libraries.

The University of Canterbury welcomes students from the surrounding area to study in the Library. Study space in the Library is limited but the high-use periods for schools generally fall outside of academic term time so this has not been a problem. The University also has a significant number of Star Students who are completing university courses while still at school. These students can use all the library spaces and on-line resources.

"Every year, UC welcomes approximately 500 STAR students from over 100 secondary schools nationwide…... STAR courses give high school students the chance to experience what it's like studying at university, get a headstart on their tertiary studies, and meet with other like-minded students from other schools. Both on-campus and distance courses are offered, and completed STAR courses can normally be credited towards a university degree later."[132]

University of Canterbury students also mentor high school students and this often takes place in the library. The Library would like to engage with high school students more as this helps to create a future pipeline of students for the University and also helps to make their transition to university easier.

The University of Otago Library is part of the annual 'Hands-on Otago' outreach programme for Year 12 and 13 students. This programme enables school students to experience Otago student life over a one-week residential camp. Each morning students participate in a Research Project in a University Department and in the afternoon, students interact with researchers exploring real life situations. Social and recreational activities in the evenings introduce students to other aspects of university life.[133]

The University of Adelaide Library offers free membership for Year 11 and 12 students who need access to the library and its resources. Access to the Library's electronic resources is only available on the public access computers in the Library. School groups also come in to use the library as part of specific courses. Students undertaking Legal Studies, for example, come in to use the Law Library for a whole day.

To help school students understand what spaces and resources are available in the library there is a self-guided tour of the library using an 'Goose Chase' App on mobile devices which includes tasks for students to complete at various locations around the library. This can be a collaborative task for new students that helps them to get to know other students.

Several of the Australian libraries in this study operated joint libraries with schools and TAFE (Technical and Further Education) institutions. Flinders University Library believes that community access to their Libraries is very important. The Library operates a shared library model with the Australian Mathematics and Science School which provides a future pipeline of students to the University.

In the Australian Capital Territory schools generally do not have access to online databases and other electronic information resources. The University of Canberra Library works with its partner schools to enable access to open-source databases and journals to support the students. The Library has also developed a range of online resources to develop academic skills and information literacy for the University of Canberra students based at their campuses that are shared with students enrolled through their partner institutions which include TAFE and international institutions.

131 University of British Columbia (k)
132 University of Canterbury (a)
133 University of Otago (b)

University of Otago 'Hands-On Otago' programme – Gaming[134]

Joint-use libraries can create challenges for the partners. Southern Cross University's Coffs Harbour Library is a partnership between the University, the Coffs Harbour Senior College and the North Coast Institute (TAFE).

"The Coffs Harbour Education Campus Library provides resources and services for students and staff of all three education sectors of the campus. The two levels of the library feature a variety of study environments including single study carrels, shared spaces and casual seating. There is a training lab, as well as 67 computers for student use, and seven bookable group study rooms with reconfigurable furniture, whiteboard and wall mounted monitor for laptops. Library staff provide general assistance to all patrons and specialist librarians are available for each of the sectors."[135]

While the Library is joint use, the building is not owned by all three partners and the other partners are reluctant to invest in an asset that they don't own. The biggest issue that has emerged, however, is that the different user groups all have different expectations about how the spaces in the Library should be used. The College students often want to use the Library as leisure space during breaks which is noisy and disturbs the Southern Cross and TAFE students who are trying to study or puts them off from using the Library at all.

2.8.2 General community access

Many of the libraries in this study offer community user membership that gives people access to the library spaces and resources, often including access to electronic resources on specific public access computers.

The University of Otago Library, however, noted that it is not sufficient to just make the space open to the public, it is necessary to reach out to the communities that you want to engage with and welcome them into the Library.

Community engagement is critical for the University of Tasmania because of where the campuses are located and because of the role the University has as being the only university in the State. Some of the University's campuses are in areas with low socio-economic status and high levels of digital exclusion and it is important that the campuses are welcoming and inclusive.

When establishing their new campuses, they stated that it is important to work with the community to help them understand how they can connect with the University and the benefits of having a university in their area. This has generally worked well on their smaller campuses where the Library may be the first building constructed on campus.

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134 University of Otago (c)
135 Coffs Harbour Education Campus

University of Tasmania Cradle Coast Campus Library[136]

People from the surrounding community need to feel welcome in the Library and know that they are able to access the spaces and use library resources. The University wants the public to come into the Library but, in some ways, the architecture and the design may be getting in the way.

At the Cradle Coast campus Library, the University of Tasmania Library has tried to create spaces that are welcoming to the Aboriginal community through the creation of an Indigenous welcoming space, art commissioning and the display of First Nations artefacts and collection items. However, the surrounding Aboriginal community do not use the library very much. The Library is a high-quality building, but it may almost be 'too good' as the people in the surrounding community may feel it is too grand or scary to enter – something more down to earth and simpler may have been a better option.

At the University of the Sunshine Coast the community can access the libraries and affiliate accounts are available for community members and students from other universities who can access the 24/7 study spaces. The Library has found that in the small satellite campuses the libraries are very much part of the community where the librarian is embedded in the community and this person's expertise and knowledge is often more important than the library itself. In the larger campuses the space becomes more important, and the librarians tend to be less visible.

St Teresa's Library at the University of Notre Dame Australia in Fremantle is currently being refurbished (completion end 2024) as part of a multi-phase project to create an interconnected student precinct. The Library is located in a two storey converted warehouse and the refurbishment with increase the amount of study space, rationalise the physical book and journal collection and move the collection to high density on-floor shelving and improve the Library's technology infrastructure.[137] The project's design has also been informed by widespread consultation with students and staff, Indigenous representatives, and the City of Fremantle, to ensure the existing character and heritage of the West End is maintained.

One of the goals of the refurbishment project is to open the Library up to the surrounding streets and remove the security barriers that limited access to the ground floor spaces. Several creative companies are based in the surrounding area as well as a wide range of cafes, an art gallery, and a bookshop. The refurbishment will connect the Library into these spaces and businesses and position it as a key partner in the Cultural Quarter. The Library wants to be a good neighbour, welcome people from the Quarter and encourage them to use the Library spaces which can be under-utilised outside of core business hours and main teaching periods, providing free Wi-Fi and a nice place to work and relax. The Library has also recently been in touch with local architectural studios to show them the architectural collections and see how they could make use of them.

136 University of Tasmania Library (b)
137 University of Notre Dame Australia (a)

St Teresa's Library, Notre Dame University Australia. Visualisation of Library redevelopment project[138]

The University of Sydney Library noted that their community engagement is enhanced through working with the Sydney College of the Arts, the Museum and University Archives to create a cultural precinct around the University's heritage Quadrangle.

The University of Waikato would like community groups to use the Library to hold small to medium sized student-led projects and events to reinforce the Library's role as 'social glue. For this to happen, it will be necessary to include spaces in the Library for preparing and serving food as these activities are an important for Māori and Pasifika events. They also noted that the Library is an important 'Third Space' that connects to wider community cultural organisations such as the Waikato Museum and the Public Library.

Deakin's University Librarian, Hero Macdonald, stressed the importance of library exhibition and events programmes:

"University libraries' exhibitions and public programmes play an important role, as part of a broader cultural heritage eco-system, in showcasing university research in new ways and to new audiences, often supporting new interdisciplinary connections and expanding community engagement."

To support these programmes Deakin University Library has created several gallery spaces and employs dedicated curators to work with researchers on the development of exhibitions and programs.

Exhibitions are also an important activity for the Chinese University of Hong Kong – both for the University community but also for the wider community' Library exhibitions provide a way to recollect memories of a community. One of their recent exhibitions on 1960s Cantonese opera singers, for example, brought people from the community into the Library to see the exhibition and meet some of the singers who attended the event.

Libraries have an increasingly important role in enabling and supporting Citizen Science with the library providing guidance for researchers and communities that want to engage directly in research projects. The Chinese University in Hong Kong Library has recently appointed an Open Science Librarian who will lead the Library's engagement with Citizen Science projects.

The Library's outreach activities have also included a recent project working with the University's School of Architecture to create a reading space in an under-utilised public space. The transformation into a reading space emerged from the various discussions during the community engagement process.

138 University of Notre Dame Australia (b)

EcoDigital Futures

Burwood Library Gallery
Deakin University, Melbourne Burwood Campus
18 May - 21 July 2024

This exhibition showcases the explorative works of Higher Degree by Research students alongside those engaged in the Media Ecologies unit and includes 360° video alongside immersive digital and creative endeavours by academics and artists in media, communications and design.

The featured works tackle the pressing ecological challenges and ethical considerations embedded within our increasingly digital lives. The artists integrate 'ecosophy' – the philosophy of ecological harmony and balance – as a guiding principle. By exploring how human interaction with digital infrastructure can serve as a conduit for critical and creative practices that honour and advance ecological harmony, the exhibition invites visitors to contemplate the role of technology in a sustainable and equitable future.

Complemented by a suite of public programs and events, this exhibition is a collaborative production between Deakin's Critical Digital Infrastructures and Interfaces (CDII) research group and Deakin Library's new exhibitions program, which provides a platform to explore the ideas that shape our University and community.

EcoDigital Futures, Deakin University Library 2024 exhibition[139]
Image credit: Darren Middleton (and Yirrmal Marika), *Runaway 2023*, **photograph and sound work (detail). Courtesy of the artist.**

CW Lane reading space, the Chinese University of Hong Kong
Photo credit: Tongyn Zhu Terrie

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139 Deakin University Library (d)

The completed space in CW Lane included a bright-red book-exchange station, stocked with books donated by CUHK Library, with the bookshelf staircase providing space for people to relax and engage.[140] The transformation resulted in an immediate increase in the number of people spending time in the public space.[141]

Community engagement can operate at a local, national and an international level – particularly where a library's collections are unique or of global significance. As well as making the collections available in the library or the creation of exhibitions and displays in the library spaces, the libraries in this study are all making their Special Collections accessible through digitisation programmes and the creation of online exhibitions and other digital resources.

The University of Bristol Library Services Divisional Plan 2023-2030 – Engaging Community, Connecting Knowledge – describes how the Library will support the University's goal to become a Global Civic University.

"We will work in partnership with local, regional, and global partners to provide opportunity for empowered participation in research, education, and the life of the University. Our Centre for Cultural Collections will maximise the potential of our world-class, internationally significant collections to deliver educational, creative, and social outcomes for diverse communities within our City and around the world.

We will democratise access to knowledge and academic skills – removing physical, intellectual, and emotional barriers to higher education – providing global access to University of Bristol research, decolonising our collections and professional practice, seeking diversity in collaborators and audiences, and welcoming all to inclusive places that contribute to the cultural life of the City."[142]

As part of this strategy, the Library is also one of the partners contributing to the Barton Hill micro-campus on a major public housing estate in Bristol with a large Somali population. A drop-in library is open once a week and

University staff and other partners run study sessions for 11 to 16-year-olds at the micro-campus and support their potential transition to study at the university.[143]

The University of Cambridge Library also discussed their strong Civic Society role. The Library is responsible for collections that belong to the world. The Library's goal is to make these collections widely accessible and share them with the world.

"Our social and cultural responsibilities as custodians of world heritage are at the heart of our mission to make the University Libraries open and accessible to all, and we strive to be innovative, creative and inclusive in endeavouring to achieve this. Central to this vision is maximizing free online access to our collections, and as we work to be innovative pioneers of digital curation, we hope that more and more will be available online, thus widening access to the global academic community. The Cambridge Digital Library plays a key role in helping us to achieve this vision. Since its launch in 2011 it has received more than 18 million visits.

Opening and sharing our collections with the world is also part of our ongoing mission to widen participation in the Library's activities, locally and globally, and to make it an inclusive and welcoming institution. Recent exhibitions, for example, Black Cantabs: History Makers and Queering the UL, have used the Library's collections to reflect upon the changing social landscape of the University, and to spark discussion and debate around topical issues. Further afield, we are working to build links with communities about whom our collections contain material."[144]

Connecting back to the communities that were the producers of items in the library's collections, or who were written about by others, is central to the mission of the libraries in this study who have significant Indigenous collections. One of the goals of the digitisation programme at the University of Hawai'i at Manoa in Honolulu is to return digital copies of items to the communities that created them, where the originals have been lost due to war or climate change.

Spitting Image exhibition notice. University of Cambridge Library [145]

140 Tovar (2024)
141 Hung (2023)
142 University of Bristol Library Services
143 University of Bristol (b)
144 University of Cambridge Library (c) , p.5
145 University of Cambridge Library (d)

Summary

The university library has long been described as the heart of the campus. It is clear from the activities taking place at the universities who participated in this study that the boundaries extend well beyond the campus. The libraries are supporting life-long learning and access to the collections in the surrounding community but also globally through access to their digital collections and online exhibitions.

Finding ways to engage with students – whether it is young children using teaching resources or high school students using library spaces and resources for homework or preparing for exams – helps to make their eventual transition to university easier and may encourage them to enrol at that institution.

Supporting wider community engagement with the libraries can be challenging – in terms of the time and resources needed to make this participation successful – but the benefits to both the institutions and the people who come in to use the library are enormous.

As Susan Considine, Executive Director of the Fayetteville Free Library stated in 2011: "Libraries exist to provide access to opportunities for people to come together to learn, discuss, discover, test and create. Transformation happens when people have free access to powerful information, and new and advanced technology."[146]

Key Findings:

1. Libraries are opening up the entry level of their buildings and providing a range of public spaces such as cafes, art galleries and bookshops to make the library more inviting to the public.

2. Libraries are acting as an active collaborator and facilitator of collaboration by bringing people together to exchange and interact with ideas, technology, and each other.

3. Libraries are showcasing their unique collections and the research activities of the University through exhibitions and public programmes.

4. Many Libraries consider the library as part of the university community outreach program allowing high school students to borrow books and use the library study spaces for homework, exam study or to participate in introductory courses.

5. Several of the libraries in this study operated joint-use libraries with schools or other tertiary education organisations although it was acknowledged that these can be difficult to manage.

6. Libraries often provide access to electronic resources on specific public access computers for students from other tertiary institutions and people from the wider community.

7. University libraries' exhibitions and public programs play an important role as part of a broader cultural heritage eco-system in showcasing university research in new ways and to new audiences, often supporting new interdisciplinary connections and expanding community engagement.

8. In New Zealand, Australia, and Canada, libraries are reaching out to Indigenous communities to find ways to break down barriers that are limiting access to the library spaces and collections.

9. Some libraries are partnering with local businesses and industry to encourage use of the library by the local workers and encourage lifelong learning.

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146 Reeder (2011)

2.9

Intensifying focus on sustainability, climate change and the future of the planet.

The libraries in the study all supported their university's sustainability plan and targets and actively contributed where they could in terms of energy consumption, recycling, furniture and other materials choices, planting both outside and in the library and use of local suppliers for food etc. Library sustainability plans and targets are generally directly linked to, or reference, University sustainability targets and plans.

The University of Canterbury intends to be Carbon net neutral by 2030. Key initiatives to support this are the conversion of the campus coal-fired boilers to biomass and the construction of a ground source heat pump on campus that will eventually provide heating to 26 buildings, including the Library, based on non-combustion based renewable energy.[147]

Every division and each campus of the University of Otago is required to nominate a person for progressing Tī Kōuka: The Sustainability Strategic Framework and to develop a sustainability action plan relevant to their own context and role.[148]

The University of Otago Library includes sustainability as the second of three guiding principles for the Library Strategy 2023-2028.

Ensure Sustainability for society, the environment, and the economy

- *affirm the value of the Library with our communities*
- *innovate services so that they are effective, and efficient*
- *allocate resources to balance current needs and long-term aspiration*[149]

The University of Notre Dame Australia is working to improve sustainability across all its operations, based on the goals of Laudato Si, Pope Francis' 2015 encyclical letter that focuses on care for the natural environment and all people, as well as broader questions of the relationship between God, humans, and the Earth.[150] At the University there is a focus on achieving net zero emissions and the reduction of energy waste and water usage.

In 2020 the University's St Benedict's Library was shortlisted for the Sustainability Awards (Education & Research category) because of the biophilic design of the library spaces and the installation of large windows to increase natural light levels and reduce the need for overhead lighting which was controlled by automatic light sensors. Other 'green' features that led to the shortlisting included desks handmade from recycled wood, reupholstered chairs reused from the former library space and the installation of live plants that improved air quality. A central green alley is also planned to connect the building to the surrounding streets and urban landscape.[151][152]

University of Hawai'i Hamilton Library: limited access to natural light and ventilation[153]

147 University of Canterbury (b)
148 University of Otago (d)
149 University of Otago Library
150 Rice (2022)
151 Sustainability Awards
152 Notre Dame University Australia
153 University of Hawai'I (c)

2.9.1 Sustainability and library buildings

Several of the libraries participating in this study reported that their existing buildings or the building services, that may be nearing the end of their useful life, created challenges which limited how the libraries could operate more sustainably. The University of Hawai'i at Manoa Library, for example, was completed in 1968 (First phase) and the extension in 1975. The Modtraveler. net architecture website notes that the library *"blends International Style with beautiful Brutalism to create a uniquely Hawai'ian modernist structure and that it known to students as 'the igloo' for its less than temperate air conditioning."*[154]

The Library has very few windows or views outside and there is no greenery or plants in the building. Where there are windows in the extension a shortage of space has led to book stacks being positioned in front of the windows which impacts on light levels. Electricity costs per annum to keep the environment in the Library stable is approaching US$4 million. A key goal of the planned future major refurbishment project will be to address these sustainability issues and create a Library that more transparent and connected into the surrounding natural environment.

Delft University of Technology's goal is to operate completely sustainably by 2030. All activities on and from the campus will then be CO2 neutral, circular and climate adaptive, and will take biodiversity and the quality of life into account.[155]

Sustainability has been a key goal of the University for many years. The Library was built 25 years ago but it incorporates a wide range of features designed to reduce energy consumption and waste that are still functioning well today. The Library's grass roof has an insulating effect and reduces large changes in temperature and the vegetation retains the rain water and the soil provided noise reduction. Slow condensation of this water creates natural cooling in summer.

Groundwater cools all parts of the building except for the study hall where heat loads from the computers require additional cooling.[156] The roof is walkable, and students use it to site and socialise during the summer and sled during the winter.

The Library has a local sustainability co-ordinator and other sustainability initiatives include the selection of carbon neutral materials such as carpets, waste management and travel policies.

Delft University of Technology Library: grass roof and central steel cone bringing daylight into the central Library space[157]

154 Modtraveler
155 Delft University of Technology (a)
156 Delft University of Technology (d)
157 ArchDaily (a)

Sunshine Coast University Library, Sippy Downs campus.[158]

Ensuring that sustainability is integral to the development of new library buildings or major refurbishment projects is generally achieved in partnership with the university Property Services or Facilities Departments.

Flinders University has the target of being one of the first climate positive universities. The campuses and facilities in South Australia are powered by 100% green renewable energy from windfarms in the State and from the solar roof and car park systems on campus.[159] The Library intends to have a carbon zero footprint by 2030 and they are also enhancing their recycling and waste reduction activities. Sustainability will be a key driver of any future refurbishment or redevelopment of the University's libraries.

The planned refurbishment of the Lincoln University Library will enhance energy efficiency through the installation of a low energy heating system.

At the University of the Sunshine Coast's Sippy Downs campus all buildings are based on environmentally sustainable design to suit the subtropical climate of the Sunshine Coast, using passive lighting and natural ventilation to minimise the use of non-renewable energy.

The University of Bristol's Sustainability Strategy includes space utilisation and construction as key themes.

Space Utilisation - *"Space within our estate, both within buildings and the space around them is a precious resource and needs to be utilised effectively. We wish to maximise our use of space through well planned initiatives to optimise their positive impact on our teaching and research activity. Operating space is resource hungry,*

needing maintenance, cleaning, heating, ensuring we can have the right space at the right time and place is essential to improve our sustainability impact. There is a need to achieve the highest and best use of space within campus centres and finding ways to promote faculty / student interaction."[160]

Construction - *"Like space, our built environment is key to delivering our teaching and research aspirations and like space it is resource hungry. Sustainable construction not only reduces running costs and long-term sustainability impacts but can also reduce capital cost. Aim to create sustainable buildings and places through the construction process. This will include aspects like, energy use and carbon emissions, circular economy principles, transport, biodiversity, waste as well as health and well-being of users, engagement with local communities and adaptation to climate change."*[161]

The design of the new Library that is being constructed on the Clifton Campus will deliver the University's sustainability objectives for new construction projects. A 'Passive' first energy strategy includes a mixed-mode displacement ventilation strategy for the main Library floorplates which enables each floor to be independently operated to lower energy consumption when not in use.

The whole building is electric, with any heating or cooling demand provided by air source heat pumps that will provide simultaneous heating and cooling, further enhancing their efficiency. The library archive is located within the basement of the building and these stores will combine ultra-low thermal conductivity, high air tightness, selective vapour barriers and hygroscopic materiality of the fabric elements to further enhance the passive strategy for environmental control.[162]

158 Hollindale Mainwaring Architecture
159 Flinders University (c)
160 University of Bristol (c), p.14
161 University of Bristol (c), p.15
162 Buro Happold

2.9.2 The Library and Sustainable Development Goals (SDGs)

The Sustainable Development Solutions Network (SDSN) for Australia, New Zealand and the Pacific stated in 2022 that the Sustainable Development Goals constitute a shared global framework of development priorities to 2030. They aim to bring an end to extreme poverty, promote prosperity and well-being for all, protect the environment and address climate change, and encourage good governance and peace and security.

The SDSN believes that universities have a vital role in addressing these global challenges and achieving the Sustainable Development Goals.

"Universities have a responsibility through their teaching to equip the next generation of leaders, innovators and thinkers to understand the global challenges facing the world and the role they can play in rising to meet these challenges. Through their research and training of research leaders, universities are at the forefront of finding sustainable social, economic, environmental and technical solutions to global problems. Finally through their own operations universities can pioneer innovation and can set an example to other sectors and businesses."[163]

The libraries in this study make major contributions to the meeting of institutional targets for the United Nation's Sustainable Development Goals through promoting information and digital literacy, equity of access to information, communication of the knowledge created in the university, providing access to digital collections and the world's culture and heritage.

The University of Otago Library stated that a key part of the Library's contribution to sustainability at the University are the Sustainable Development Goals and it does this by exploring what it means to be a good citizen. The Library also said it is important to consider the financial sustainability of the buildings on the campus, including the libraries, to ensure that all the spaces are used efficiently.

The University of Technology Sydney Library noted that the e-preferred collection strategy that the Library operates, and the move to the adoption of open educational resources, also contributed to achieving the SDGs by supporting equity of access to information resources. RMIT also noted that shifting to digital collections meant that physical books were not being purchased and shipped around the world from the publishers which leads to a reduction in energy use.

The University of New South Wales Library contributes to the University's initiatives to contribute to achieving the SDG goals. The Library has also created learning objects exploring the Library's SDG goals and in 2022 the Library hosted an exhibition called 'Do Something' that was curated by the The Wicked Collective for Climate Change and Sustainable Development - five academics from the School of Art and Design. This exhibition presented creative responses and interventions to the wicked problem of Climate Change from students and staff across the Faculty of Arts, Design and Architecture (ADA). with works all relating to one or more of the United Nations Sustainable Development Goals.

At Lincoln University the library archives the media releases and enables the application of SDGs to the university news stories. The stories are being actively linked to SDG tiles as the archive is further digitised retrospectively.[164]

2.9.3 Libraries and the carbon impact of digital collections

Many of the libraries in the study were aware of the carbon impacts of their digital collections and data repositories and were actively trying to reduce this carbon load through careful vendor selection and the minimization of what is being stored.

RMIT Library is aware of the impact of the digital collections and the use of open educational resources on the footprint and energy use of the server rooms required to house this material and they are endeavouring to minimize what is stored.

Southern Cross University Library is working to reduce its digital carbon footprint and it has been renewing its own information management practices including the amount of data held on the University servers. In terms of the Library's digital resources, the Library wants to make sure that their e-book and e-journal vendors are offsetting the carbon loads resulting from Cloud storage and this is considered as part of the procurement process for all contracts.

As well as reducing the physical book collection, the Library is also monitoring e-book usage to see if the collection can also be reduced which will also reduce the overall carbon load of the Library. Recent data has suggested that the University's move to block teaching based more on journal articles has reduced the demand for e-books.

163 Sustainable Development Solutions Network
164 Lincoln University (b)

The University of Otago is in the process of moving its Data Centre to a large, shared facility in Southland to create a scalable Data Centre that is more energy efficient and can support the research, teaching, learning and operational needs of the University including the Library. The 43-hectare carbon neutral facility in Makarewa will boast a capacity of up to 150 Megawatts and the university hopes to start using it in 2024. The data centre will be powered by the Manapouri hydro power scheme, and Southland's relatively cool annual average temperature of 9.8 degrees will make the data centre at least 15 per cent more power efficient, further lowering cooling costs.[165]

2.9.4 Libraries as living labs

Several universities in the study discussed the opportunity to make their libraries 'living labs' – to use the buildings to explain how they were contributing to combating climate change and through creating exhibitions and events programmes as part of their student engagement programme.

Griffith University is a participant in the University's Green Impact Programme and it is delivering a programme of work to demonstrate how the Library contributes to achieving the University's Sustainable Development Goals via the development of the collections and equity of access to the information resources.

The University of Sydney Library is trying to implement pragmatic solutions to sustainability issues, examples being the banning of disposable cups and the sustainable sourcing of food for the café and providing inexpensive food for students during exams.

The University of Tasmania Library noted that the Library has a role in engaging its visitors regarding the building itself, including sustainability features, through tours, interpretation, and curation as well as encouraging access to the spaces and the collections by the University and wider community.

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165 O'Neill (2022)

Summary

In 2021 the Presideent of the American Library Association stated that to evolve and thrive libraries *".....must adopt the "triple bottom line" mindset of sustainability: We must embody practices that are environmentally sound, economically feasible, and socially equitable."*[166]

The participating libraries in this study are all contributing to their institution's sustainability strategies and this happens at various scales in both the physical and digital worlds. New library construction projects and the refurbishment of existing library buildings provide the opportunity to embed environmental sustainability at the heart of the library's design and operations and create a true 'living lab' and learning and research opportunity for students and faculty.

The libraries also have a major role to play in the delivery of the United Nations Sustainable Development Goals by promoting information and digital literacy, equity of access to information, communication of the knowledge created in the university and by providing access to digital collections and the world's culture and heritage.

The increasing emphasis on digital collections in many of the libraries also highlights the increasing importance of the role that the libraries will play in managing the amount of digital material that is stored on servers within the institution or in the Cloud to reduce the energy consumption required for this storage to the minimum.

Key Findings:

1. Most universities have established goals and strategies to achieve carbon neutrality by 2030 or 2050. These are typically managed centrally, and the efficiency of buildings is a major part of those strategies.

2. Many Libraries are operating in older buildings with building services which are nearing the end of their useful life, limiting the potential for improvements in efficiency without major overhauls.

3. Where small improvements can be made these are typically focussed on areas where improvements can be made which achieve maximum impact with minimal intervention such as the introduction of low energy LED lighting, daylight harvesting, improved HVAC controls and the substitution of non-renewable energy sources.

4. Libraries are keen to improve the well-being of staff and users through improved daylighting, connection to the outdoors and the use of plants and biophilic design.

5. Sustainability energy efficiency and carbon neutrality are a key focus of all refurbishments and new build library constructions, often with external validation of environmental performance through national certification bodies such as Green Star, LEED and BREEAM.

6. Universities are now often seeking to achieve carbon zero in terms of the new building's operational carbon impact through improved energy efficiency and renewable energy supply. The more ambitious are seeking to achieve carbon zero in terms of the buildings embodied carbon impact (the carbon emitted in the creation of materials and construction of the building) resulting in the adoption low carbon construction techniques such as mass timber structures.

7. Most libraries focus on the UN Sustainability goals and see their primary impact through their ability to influence social equity and equity of access to information.

8. Libraries also see an opportunity to support and encourage research and innovation in sustainability through interdisciplinary forums and collaboration with industry to showcase innovation in exhibitions and events programmes.

9. At an operational management level libraries focus on recycling of waste and food sourcing and recycling of food waste.

10. The reduction of physical collections and the use of offsite storage facilities is offering the opportunity for improved efficiency in the housing of the collections including creation of passive energy stores.

11. There is a growing consideration of, and desire to reduce, the digital carbon footprint through management of data storage, the use of carbon zero offsite data storage providers and downstream efforts to influence suppliers of digital material.

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166 Wong (2021)

Library as workplace.

The role of the library staff in providing students with the skills they need to navigate the knowledge universe is still valued by students at all levels. Libraries lead the way in digital and data literacy through both online and face-to-face classes and consultation sessions. Increasingly, self-help digital resources are available to solve simple problems, freeing library staff to work with students and faculty on more complex problems.

At an institutional level many of the libraries in the study played a critical role in the establishment and management of data repositories, open access publishing and the development of open education resources and bibliometrics to establish impact and reach of the University's research activities. To support the expanding role of the library an increasingly diverse library workforce will be needed that combines traditional librarianship with user experience, digital scholarship, cultural, student welfare and community engagement skills.

2.10.1 Library skill sets

It was widely reported by the libraries participating in this study that the range of skills required in the library is increasing to support the diverse services they are offerings including increased emphasis of user experience and the creation and management of digital collections.

RMIT Library now has fewer staff undertaking basic activities such as shelving. The skills levels required are now higher and a broader set of skills is required. The Library has found that having a more diverse set of backgrounds is a strength when delivering projects.

Southern Cross University has found that their existing librarians' skill sets are fit-for-purpose for their future library where the emphasis is on ethics, values, and the de-colonisation of the collections. The core library skills can adapt easily to a digital environment and a hybrid way of working. They may need to acquire new skills areas in areas such as research data management, the curation of digital repositories and artificial intelligence but they are already doing this by taking micro-credential courses and self-directed learning. The future will be about increasing the number of qualified people in the Library rather than de-skilling some of the roles.

Library staff at Griffith University take responsibility to keep up with the major issues facing the sector and they have digital champions in the Library looking at issues such as the development and delivery of Artificial Intelligence and Academic Integrity awareness modules.

At Flinders University Library, as part of the research and learning culture they have developed, staff are empowered to develop as knowledge experts and internal talents to take on new roles. New skills are needed and they have found that some Library School graduates are not arriving with a comprehensive set of skills that would support emerging roles.

At the University of Technology Sydney Library, the staff profile now includes more non-librarians. The skills required to manage the physical collection are less in demand and new skills are required to drive a different sort of Library that is not so tied to the physical collection. They take a broader view to recruiting graduates into roles within the Library, looking at both graduate librarians and graduates from other areas who are interested in libraries and have user experience or digital and physical engagement skills.

Both Deakin and Curtin University Libraries stated that new skills were needed in the library, particularly around experience design, curation of exhibitions and public engagement. Other new skills areas identified by several of the participating libraries included the support of Indigenous collections, artificial intelligence, development of machine-readable collections and digital scholarship. It was noted that librarians are generally not trained in these areas and these new roles may require the employment of PhDs, computer scientists and graduates from a range of disciplines.

Te Tumu Herenga | Libraries and Learning Services at Waipapa Taumata Rau | University of Auckland believes that staff need to have a personal growth mindset, be comfortable with ambiguity and change, and be able to work in partnership with others. Staffing challenges for the Library include recruitment of collections and technical staff as well as Māori staff.

Massey University also stated that competencies in Te Reo Māori and Pasifika languages are important, and that other areas that need growing in the future include a wider understanding among staff of online systems, data management, integrity, protection and privacy.

The new University Librarian in 2021 at the University of Waikato Library used the opportunity of a number of vacant positions to intentionally ensure that the Library staff reflected the student body, creating six new Māori and Pasifika roles.

At the University of Hawai'i at Manoa's Hamilton Library the staff are diverse and represent the diversity of the general population - 60% of the students are non-white, as are 58% of library staff. One of their challenges is to get native Hawai'ians and other cultures into the library profession as library staff are often tenured and tend not to leave. The Library is exploring the creation of a native Hawai'ian fellowship programme that will provide roles for native Hawai'ian Library Science graduates for several years after they complete their course.

The University of Sydney stated that the library workforce model is changing. They run a cadetship for recent graduates of librarianship courses or related fields. Future roles are likely to include direct support for teaching, the student experience or research. One staffing challenge post-COVID is that Library staff has been when staff have been 'poached' by Faculties. The Business School's AI fluency course, for example, was developed with input from a former library staff member.

At the University of South Australia Library many library staff are professional librarians. Level 5-7 staff are library qualified while Level 4 Library Officers undertake a range of customer service and back-of-house collection management services, including the provision of the on-line Chat/Phone/ Email service. With the reduction in the physical collections, staff have been brought back from the smaller libraries with very small collections and are working on core library programmes. Level 4 staff are being upskilled as the back-of-house collection management is less necessary. Graduate Library Officers are Level 4 but will become Level 5s and they will rotate through all the library Departments to get experience. This will support retention and skills development across the library.

Monash University Library notes that professional development pathways are available through the Australian Library and Information Association. This enables staff to learn on the job as people coming into the library might not have the right blend of skills in areas such as customer service, information services, professional services co-design, project management and data analytics.

The Library's priority areas for capability development reflects its role as a professional services provider.

The University of Canterbury Library is trying to avoid building up new teams to deliver new initiatives, preferring instead to partner with other university units to deliver new services. This approach is also being adopted by the University of New South Wales Library who stated that they do not want to duplicate skill sets or activities that happen elsewhere on campus in galleries, museums, or student skills hubs. For example, there are already Mathematics, Science and Data Hubs elsewhere on campus. These could be collocated in the library in the future, but they do not need to be run by the library.

At the University of Bristol Library new library staff hires are focused on engagement and connection to city life and the future role of the Library as cultural hub. They want to employ people who are forward thinking in their approach to the role of digital in the collections and able to work across areas and develop partnerships. The Library is also wanting to achieve better representation of cultures and representations of global cultures in the workforce.

University of Helsinki Library Co-Learning Centre experience design workshop
Photo credit: University of Helsinki Library

2.10.2 Student employment

Many of the participating libraries are using casual student staff to undertake a range of library roles. At the University of Canberra student advisors were originally in two teams – 'library rovers' and 'academic rovers.' These teams have now merged and have been up skilled to support all student enquiries.

Service points at the RMIT and Southern Cross Libraries are staffed by student casual staff who function as connectors, linking people to digital support and providing wayfinding and First Tier library support.

At the University of Technology Sydney Library student guides are part of the library Client Services team and they contribute to social media and support library enquiry services as well as delivering peer to peer support in the Student Learning Hub.

At the University of Melbourne Library, a large casual student workforce manages the out-of-hours operation of the libraries. This will also be the case at Monash University where the Library has rethought its after-hours staffing to focus on student well-being, including using students as Library Experience Assistants offering peer perspectives and gaining valuable employment.

2.10.3 Agile and flexible working

Library staff workplaces are, in many universities, very traditional with space allocated by seniority. Senior library leadership may have their own offices, but many library staff are likely to be in shared offices or open plan work areas. These may be collocated in a central library staff area or distributed around the library close to book and journal stacks. In addition, there are generally a range of workplace support areas including meeting rooms, storage areas for book returns, furniture and a shared workroom where the management of the collection takes place.

The traditional library workplace model may no longer support the range of activities that the library is responsible for, or provide staff with the work settings that they need to achieve their roles and responsibilities in a pleasant and healthy work environment.

At Lincoln University, Library staff are mainly based in a large, shared work room. While the staff like the collocation in terms of knowing what is going on across all the functions, the noise levels in the space need to be managed. Quiet working and break-out spaces are provided nearby to support other work activities.

University of Sydney Library marquee, USU Welcome Fest 2024[167]

167 University of Sydney Library (c)

COVID has accelerated the changes in working practices in several of the libraries. The University of South Australia stated that their staff are all working more flexibly. They were able to deliver their services remotely during COVID and these practices have continued. Staff like being able to break up their work week to suit their life needs. After hours librarians, for example, are available on rotation until 11pm each week night and they can perform this function from home, live, via a VPN network.

At Deakin University the Library has moved to a more flexible approach, with many new recruits being offered a choice of their preferred home campus.

At RMIT COVID has also accelerated the transformation of their Library service model. The traditional workplace was not performing well to support the new model which is closer to that of an agile IT company rather where teams form and work together to deliver projects that are of strategic importance to the University.

Delft University of Technology Library is currently re-thinking their staff workspace now that more staff are working from home for some of the time. They do not intend to create fully flexible, non-assigned workspace as they believe this is alienating. Instead, they want to create a workplace that consists of several departmental 'neighbourhoods' where colleagues are likely to find each other.

At the University of Wollongong Library, a combination of COVID-related reductions in staff numbers and increased flexible working practices resulted in vacant Library workspace. These areas are now being used to accommodate departments or groups such as Learning Support that provide related services to the Library. In some of the smaller regional libraries several of the vacant workstations may be used by academic staff.

Massey University Library believe that staff require the same range of work settings as the students who us their libraries. They are increasingly providing on-line services or are meeting with colleagues and students from all three campuses, so they need space that is acoustically and visually separate from the rest of the workplace. Staff also need access to recording studio facilities to create video-based learning resources. There is, however, still a need for a traditional library work room.

At the University of Tasmania university policy is that all Departmental workspace is shared and staff need to book a workspace each morning they are coming to campus. This also includes library work areas and academic staff can now choose to book a workspace in the Library staff area. It took some time for library staff to get used to this but it has resulted in useful conversations between library and academic staff.

Currently, students at the University of Tasmania need to make an appointment to see a librarian which is not satisfactory. Future workplace changes in the library will include making library staff more visible and approachable by locating them out on the library floors.

University of Tasmania Library student support[168]

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168 University of Tasmania (c)

Summary

The workforce in the libraries in this study is becoming increasingly diverse, combining traditional librarianship with user experience, digital scholarship, cultural, student welfare and community engagement skills. Students also contribute significantly to the library workforce providing support in a range of areas including staffing the library service points, managing the library collections, acting as face-to-face and on-line learning and research advisors, and providing well-being and pastoral care to their fellow students.

Traditional library workplace models may not provide the most effective work environments to support library staff work activities and the requirement for workspaces that can support online meetings as well as individual and team-based working. Several of the libraries in this study are currently re-thinking their library staff work areas to create activity-based workplaces that take account of the increased flexible working across multiple locations by staff, the increased requirement for team-based project work and the blend of face-to-face and on-line activities.

Key Findings:

1. Increasing changes in the roles of librarians are requiring staff to be flexible, open to upskilling and learning new roles.

2. More roles being filled by non-traditionally trained library staff. These might be roles in customer experience, computing and digital media or roles with a focus on Indigenous cultures.

3. Increased desire for the diversity of staff to match the diversity of the users to better understand their needs.

4. Increased use of students to provide an on-floor support as guides, rovers and testers.

5. Many library staff work in shared office spaces however there is desire in some libraries toward the locating more desks on the library floor to make staff more accessible to students.

6. Post COVID , more staff are working from home for periods each week, reducing the utilisation of desks. This is leading some libraries to explore new activity-based workplace solutions with shared desks, space for quiet working and increased access to support spaces such as meeting rooms and pods for on-line meetings and development of learning resources.

7. Some libraries are sharing under-utilised desks with staff from allied departments to encourage collegiality and joint working on projects e.g. learning support, student services or academic staff.

8. On-line working platforms such as Teams are supporting working from home and helping to unite staff from separate libraries in the network.

9. There is less need for space for book processing and some of these spaces are now being re-purposed to create that support digital roles or other student amenity spaces.

3.

Realising the Future Library.

3.1

Library as enabler of university strategies.

The library can be instrumental in helping Universities achieve their strategic vision. It is integral to the success of several critical parts of university life: learning and teaching, research and innovation, student experience and community and industry engagement.

The activities that will take place in the future library go far beyond the traditional view of the library – individual study spaces for quiet study and the storage of books. The Library engages with every student, every researcher, and every department and can enrich the campus experience. It is a connector, the hub of local, national, and international networks, connecting and working closely with other parts of the University, researchers within the faculties, the wider community as well as international library and research community.

Changing societal expectations, pedagogy and the campus demographic are requiring libraries to provide an increasingly rich landscape of study settings and amenities. Libraries and Library staff are needing to be responsive to the rapidly changing academic and technology environment and changes in expectations and needs from students and academic staff.

As library's physical collections are being reduced, their digital collections are expanding and the library is becoming a centre of expertise on the impact of new technologies on learning and research including AI, meta-data management, digital scholarship and the creation and management of non-traditional forms of assessment.

John Cox from the National Library of Ireland explored the positioning of the academic library within the institution in a literature review published in 2021.[169] He noted that appropriate positioning in the institution is vital for any academic library and is strongly linked to its recognition, resourcing, and prospects. Close alignment with institutional strategy is a key factor to successful positioning.

Libraries are operating within rapidly changing higher education institutions (HEIs) which impacts the strategies they pursue and creates adaptation and alignment challenges for libraries.
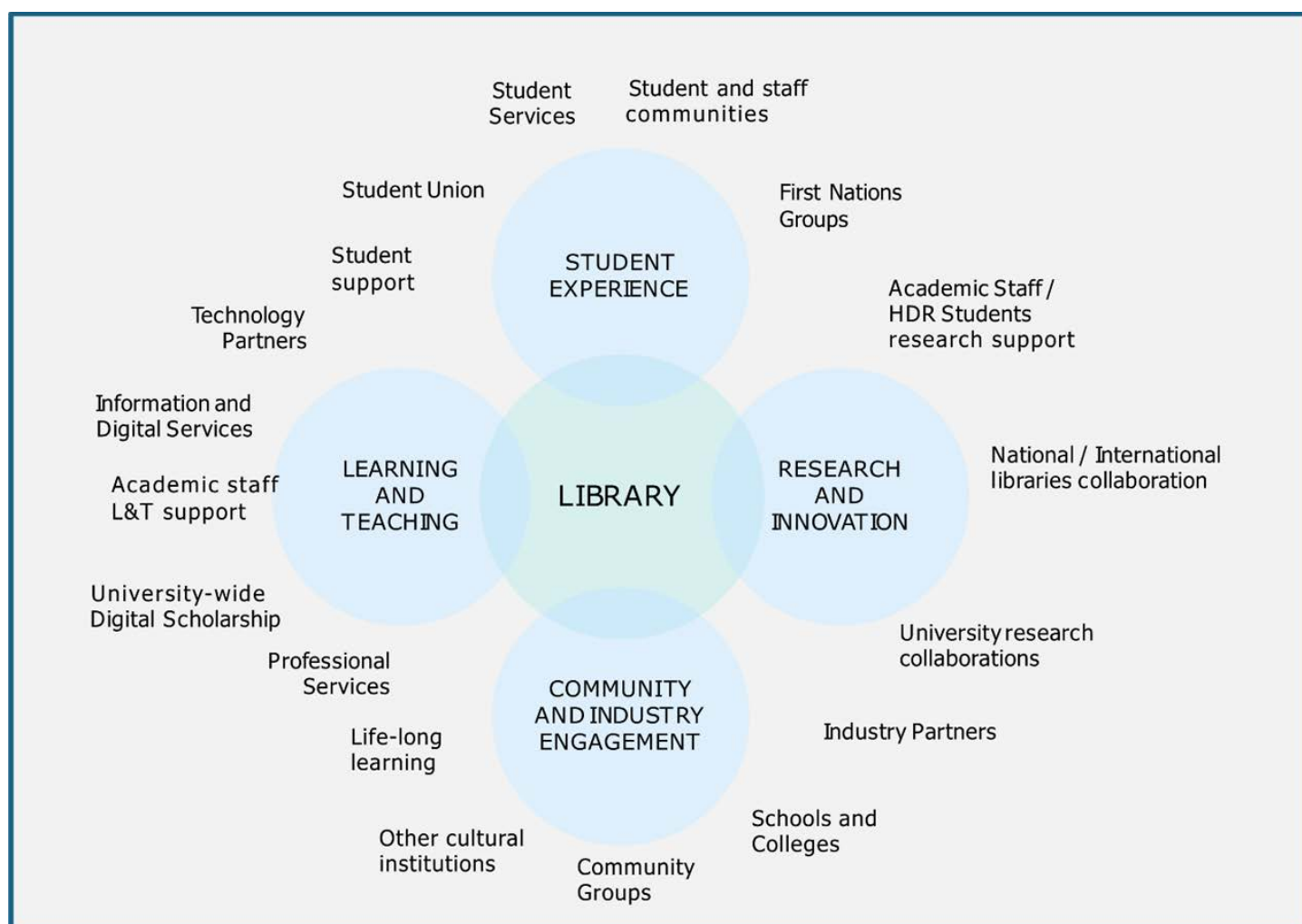
Library at the centre of local, national and international networks
© Warren and Mahoney (2024)

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169 Cox (2021)

He found that many HEIs operate more like businesses, shaped by multiple drivers such as greater accountability, stronger competition for students and research funding, higher student expectation, internationalization, and challenging economic conditions. Areas of particular focus include student success, internationally recognized research, community engagement, global reputation and metrics-driven demonstration of impact.

Technology has increased student choice and expectations and continues to transform how learning happens, emphasizing greater flexibility, influencing learner behaviors, and changing the profile of the student body. It also profoundly affects the ways in which research is conducted by promoting more collaborative and computational approaches.[170]

Cox believes that these shifts in institutional operating environment and strategic focus have significant implications for the library and its positioning in the organization. Traditionally the library was viewed as the heart of the campus and there was an almost unquestioning acknowledgement of the centrality of its contribution to the institutional mission. He believes that this situation has now changed fundamentally, and it is up to libraries to prove their worth to stakeholders who are asking different questions and seeking new value as their priorities evolve. Other changes impacting the institutional environment for academic libraries include:

- The involvement of multiple players in information management on campus
- Staff and student access to alternative local and global information sources
- New expectations of student experience and engagement
- Changing researcher needs
- Creation of new audiences through internationalization.

These changes have significant implications for how libraries operate in their institutions in terms of strategy, space, structures, partnership, and identity. The manifestations of these changes are, according to Cox, readily evident and include the creation of learning commons buildings, the provision of research data management services, the adoption of converged service models, the creation of new relationship manager posts, and branding of the library as partner. Libraries are becoming more outward looking and keen to share space, infrastructure, and expertise, committing themselves to alignment around institutional priorities.[171]

"Academic libraries are operating at a higher level of specialism to meet new expectations from researchers, funders, and their parent institutions. Digital scholarship has opened up new roles and partnerships, leveraging library skills in preservation, description and dissemination. The publishing role of libraries has become more prominent in expanding open access to research outputs, including data as well as publications. This has positioned libraries well in helping their institutions to maximize and measure the impact of their research, enhancing international reputation."[172]

In the conclusion of the literature review Cox stated that the shift in focus from collections to users has stimulated major changes in the way library space is presented as an enabler of interactive learning. That shift has, in turn, moved the deployment of library staff towards stronger engagement with academic staff, students and campus partners.

However, he also found that, despite the repositioning that has taken place in many libraries, the perception of them within their institution did not always reflect an understanding of these changes. The review *"noted divergences from institutional leadership and academics, a loss of position at the heart of the campus, and a tendency for libraries to be taken for granted. Communication appears to be an issue and more works needs to be done to capture scarce attention in busy institutions and to pit the new library agenda against traditional perceptions of its contribution."*[173]

These many changing demands are requiring library leadership teams to be both agile in their thinking and clear in their goals to establish the appropriate strategy for their institution.

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170 Cox (2021), pp. 9-10
171 Cox (2021), p. 27
172 Cox (2021), p.26
173 Cox (2021), p.27

3.2

Creating a roadmap for the future library: 10 key questions.

At the highest level the University must decide the vision and role of the library within the University's overall strategic plan. Based on the discussions with the participating libraries a number of key questions emerged from the study that may provide a useful tool in developing a shared vision for the future of the library.

1. What part must the library play in creating a vibrant campus and enhanced student experience?
Post COVID, many Universities are facing decline in enrolments and increasing competition for students and long-term demographic projections would indicate that this trend is set to continue in western nations. Enhancing the student experience and improving the appeal of the university has become a key focus for universities. The library can be more than just a study destination, it can become home from home, a place to make social connections providing students with a sense of belonging, and shared endeavour. Many libraries in the study are providing an increasing variety of amenities and services designed increase engagement, increase the use of the library, and help build the campus community.

2. What role does the library have in student success and welfare?
The library cannot be apolitical when it comes to equity. The library provides students, irrespective of their social, financial or living circumstances, access to the study spaces, technology and services to support their study, social and welfare needs The libraries in the study all had the support of their learning community at the heart of their mission and they provided a range of face-to-face and online study, research and writing skills classes for students. Some are now also providing staffed events and activities to support positive mental health and combat isolation of students. Many have adjacencies with student services allowing for a broader base of support.

3. Should the library be a demonstrable leader with respect to social issues of inclusion and equity?
Libraries are at the heart of every university, linked to every department and every student. As such they are representative of the culture of the organisation. The corelation between inclusion and academic achievement are becoming better understood and involve not just equal access to education and the tools for study but also an educational environment in which offers a sense of belonging and inclusion to all members of the student cohort. Inclusion and equity were a priority for all Libraries consulted. Accessibility is viewed in the widest sense with focus on First Nations, students with young children or physical disabilities, and communities identifying as Neurodiverse, and LGBTQ+.

4. What pedagogical changes need to be anticipated and how will these impact future library spaces and services?
Changes in pedagogy are having a significant impact on the provision of study space. Examples of these are the adoption of block course which can impact utilisation across the year, or the recent growth of online courses which are having a significant impact on the demand for quiet and bookable study spaces.

5. What is the role of the library with respect to the management or provision of study spaces?
Over the last two decades the adoption of blended learning has led to the rapid investment in new informal study spaces across campuses. However few, if any, universities have a coordinated masterplan of informal study and student hubs to help manage quality, avoid duplication, and ensure that the right mix is provided in the right locations across the campus. Libraries have an untapped expertise in the design and management of study spaces, a knowledge which could be used to inform other study spaces across the campus.

6. How important, functionally or culturally, is the physical collection to the University?
Few academics and fewer students now use the physical collection and as a result typically 90-95% of current acquisition budgets are spent on digital material. All the libraries in the study are engaged in actively reviewing and reducing their physical collections (a 50% reduction target was common) to create more space for additional study seats or other facilities. The process of right sizing has proved challenging culturally with most libraries retaining some books on the basis that they play an important role in creating the character of the library.

7. What is the future role of Special Collections?
Special collections are increasingly being seen as Unique Selling Point for Libraries and several of the libraries in the study were undertaking extensive digitisation programmes to make high-resolution digital scans of their physical accessed anywhere in the world. The nature and quality of special collections vary greatly, with some institutions holding material which, arguably, may have little alignment or value to the University. In many cases a strategic review of the special collections may be warranted to understand their purpose and how they might be strategically managed or proactively grown to deliver the greatest value to the University.

8. What is the role of the library with respect to the growth of digital scholarship?
Technology and data are reshaping our world and opening new opportunities for study, problem-solving and knowledge exchange. Although universally recognised as a significant opportunity for every University, there is little clarity over how the cataloguing, storage, and use of digital material by researchers might develop over time. A central strategy is required to coordinate and stimulate advancements in the digital scholarship, or universities are likely to fall behind It is not clear if it is the role of the Faculties to stimulate and lead the growth of digital scholarship or if there is a need for a co-ordinating role by Library.

9. To what extent is it anticipated that the library provides a neutral supporting role to facilitate interdisciplinary research or industry engagement?
The library has an increasingly important role in ensuring the visibility and accessibility of the research outputs of the University. It has become the keeper, curator and publisher of research and has a pivotal place in the research landscape. It works with every researcher and in this way often functions as a connector, or directory, able to facilitate interdisciplinary (or external) research connections. It is ideally placed to provide space for showcasing research, providing shared access to new technology, networking or collaborating.

10. To what extent does the University want to engage with the wider community?
Libraries in the study varied greatly in their level of engagement with the wider community. For some it was not considered their core role, others had insufficient space while others still were proactive in their engagement with local schools and the wider community, running a variety of public exhibitions and events.

3.3

Five conceptual models for the future library.

In response to these changing demands and priorities it has become clear from the study that the library model and its relationship to the wider campus is evolving. While there were similarities between all the libraries participating in this study, each had different priorities and approaches. Based on our learnings from this study there appears to be five high-level models that can be used to describe the evolving University Library. These development options are summarised in the diagram below.

One option is that the library continues its role as a stand-alone facility at the heart of the campus in line with Jamieson's (2005) statement that: "The primary role that the central campus library plays symbolically, geographically, and functionally in the life of a university ensures that this building is an integral element of the university experience for most students." This option has been named **'Library as Island.'**

Many of the libraries in the study also contained a range of other student support services including Student Services, IT and learning support, that benefitted from the central location of the libraries and the high daily footfall of students coming into the library. Several of the libraries in the study were also directly connected to student centres with catering and Students' Union facilities as well as other informal study spaces.

Given the extended periods of time that students are increasingly spending in libraries to both study and participate in online classes, the student experience may be enhanced by closer integration of the library with these other facilities, creating a comprehensive Student Hub embracing students' study, social and welfare needs. This option has been named **'Library as Hub.'**

The study and learning settings within the physical boundaries are managed by the library itself. However, the design of informal study areas in other parts of the campus was often led by Faculties or other parts of the university as part of new building or refurbishment projects. The management of these spaces over time was variable with some universities reporting problems with maintenance, technology provision or student safety in unmanned spaces out of hours.

The library study spaces often set the benchmark for student expectations about study environments and some libraries are responding by taking responsibility for the ongoing management of the other study spaces – ensuring they are functioning well and are maintained, as well as providing drop-in library services and support. In the future, campus-wide informal learning space strategies may be needed to ensure equity of access and experience and it seems likely that the library will have a core role in creating and managing the campus study environment. This option has been named **'Library as Network.'**

An alternative approach is that, as study spaces are created across the university in Faculty or student amenity buildings, there is less requirement for these to be provided within the library itself. The library can possibly reduce in size to reflect the smaller physical collections it holds, with the remaining spaces focusing on managing the digital collections, providing information expertise to students and faculty and the provision of specialised facilities such as digital scholarship centres and digitisation and media production studios. This option has been named 'Library as Clinic.'

Library as **'Island'** - library as a distinct, identifiable facility housing all library functions.

Library as **'Hub'** – library as part of a collection of student facilities designed to enhance the overall student experience, located together to create a vibrant heart to the campus

Library as **'Network'** – library extending beyond the central building, permeating the campus with library-managed snd curated study spaces in Faculty and amenity buildings

Library as **'Clinic'** – library as the place to access information expertise and resources with study spaces provided by others across the campus.

Library as **'Metaverse'** – library experiences and resources primarily digital via the library web services, AI, virtual and augmented reality. The library is everywhere.

Five conceptual models for the future library.
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Lastly, the acceleration of the growth of the digital collections and service delivery by the library could continue to the point where the library website and AI, augmented and virtual reality provides a complementary and equivalent experience for students and staff to that provided in the physical library spaces. The physical library continues to be important as a place to house the Special Collections, technical library infrastructure, staff workspaces, exhibition and events spaces and study and social places where students and staff can meet and work. The library is everywhere. This option has been named **'Library as Metaverse.'**

The diagram below illustrates a selection of complementary digital and physical experiences in the 'Library as metaverse' model, divided across 'public', 'invited' and 'private' activity zones.

In many universities, however, the future academic library is likely to be a hybrid of several of these options - creating a significant campus building that is an integral part of the student campus experience, well-connected to student social and well-being amenity spaces and containing specialist facilities such as digital scholarship centres and media production studios that will be available for use by all parts of the university.

While the library may not manage all study spaces on campus it is likely that the library will have an active role in both designing, managing, and curating other significant campus study spaces to ensure equity of access and experience across the university.

The development of AI tools and the use of augmented and virtual reality will provide users with new and enhanced ways of accessing and exploring library resources and create new opportunities for research and collaboration.
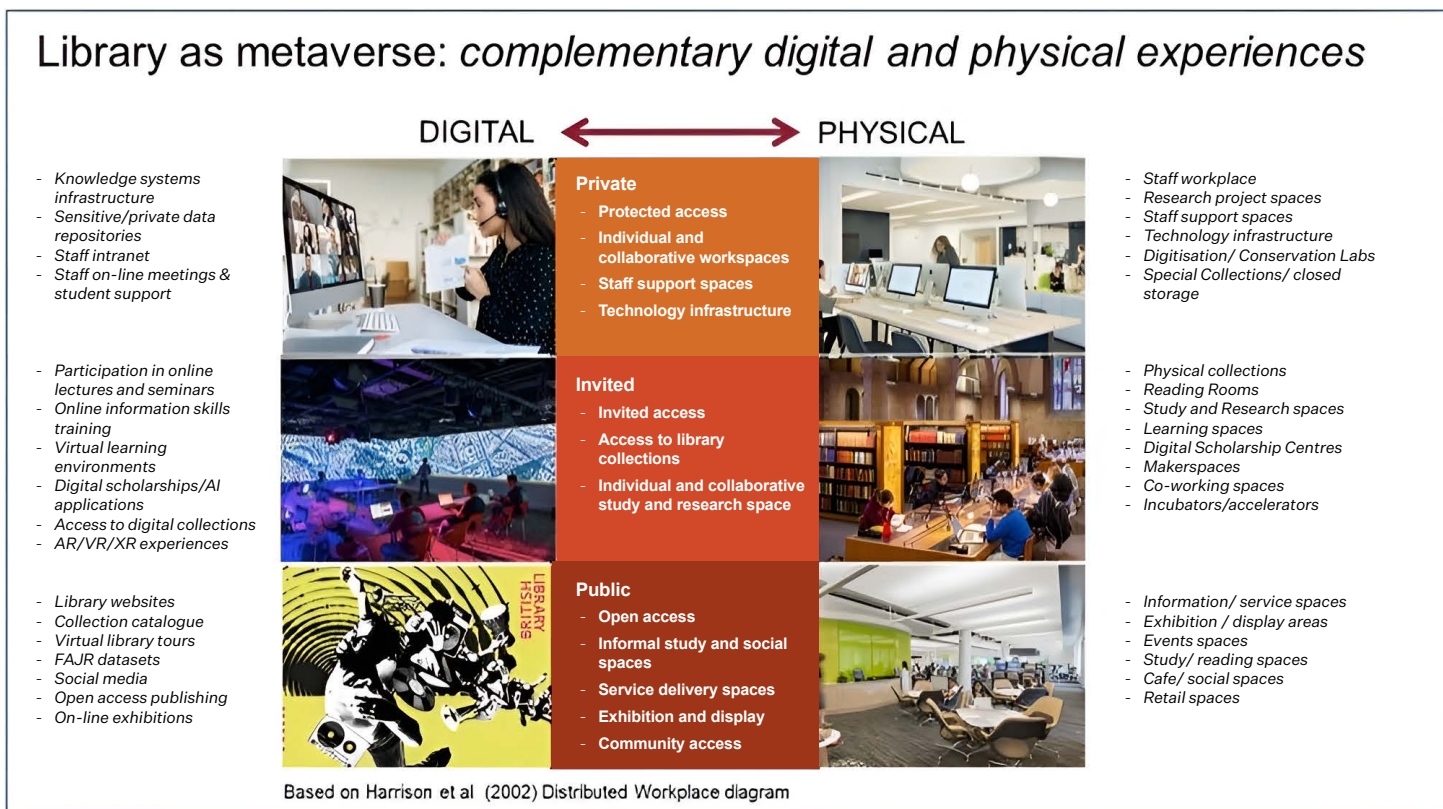
Library as metaverse: complementary digital and physical experiences
© Warren and Mahoney (2024)

Although there were similarities, every participating library varied in terms of priorities, opportunities, and challenges. It was clear from the discussions that the library has the potential to adopt many roles in support of the objectives outlined in the institutional strategic plans.

Library as knowledge hub

The digital collections are now the heart of nearly all academic libraries. Many of the libraries participating in the Future Libraries research study reported that 95-99% of their acquisitions budget is now spent on digital resources. The future library should provide a range of physical and digital spaces for library staff and students to engage with digital resources and external data sources. The physical collection should remain accessible and welcoming to library users and be used to create neighbourhoods and spaces with different character throughout the library.

Library as workspace

The future library will need to provide a rich landscape of study and research settings to support both individual and collaborative working. These settings will need to be enabled by different blends of digital tools including access to large, shared, or multiple screens, docking stations, high speed computing, video editing and AR/VR/ XR or visualisation technologies.

Library as incubator

Library spaces and services can support the development of student, staff, and community businesses though the provision of workspace for start-up businesses and microbusinesses, business mentoring using staff and student advisors, digital rights management support and by hosting innovation and entrepreneurship focused events – engaging with local businesses and the wider community.

Library as research centre

The future library can support the University's desire to intensify research activities. The library will continue to have a crucial role in managing and curating the University's research data and in showcasing research outcomes.

Innovation spaces can support the development of new research projects, the creation of interdisciplinary research teams, the co-creation of funding applications, the ongoing management of complex research projects and engagement with industry and other external partners.

Library as living lab

The future library will become a 'Living Lab', exploring how students and researchers can better access and use digital material. Technology-enabled learning studios can provide a testbed for the development and delivery of hybrid or blended pedagogies, the use of AR/VR/XR and AI to support learning and teaching or, for example, testing the impact of AV over IP on collaborative working.

Library as living room/ sanctuary

The future library should be an inclusive space and safe where everyone feels welcome. The design of the future library should include a holistic approach to cultural and inclusive design based on co-design with diverse student, staff and community groups. The design of the library will create a series of spaces with different characters and blends of settings that allow people to find places where they feel comfortable to be themselves.

Library as treasure trove

A library's Special Collections and art collection are often hidden away in a secure room in an out-of-the-way part of the library. In an increasingly digital world, these items take on new meanings and provoke curiosity and wonder.

Creating a modern library that goes beyond traditional, encompassing both physical and technological aspects.

Conveying a welcoming, unique, and warm character, catering to the diverse needs of students, researchers, and educators alike.

Designing an environment that fosters dynamic learning, collaboration, and technological advancement.

Empowering library users in their research and learning journeys.

Managing, curating and showcasing the University's research.

Providing increased capacity and variety of quality student study settings.

Enabling seamless transitions between individual study and collaborative working.

Providing state-of-the-art information access through digitised collections, e-books, and academic databases.

Summary: diverse future library roles to support the university's strategic goals
© Warren and Mahoney (2024)

Where possible, the Library's Special Collections and artworks should be made visible throughout the library, creating 'Cabinets of Wonder' that help to create distinctive characters for the study zones and learning spaces in the library – blending physical and digital artefacts in new and exciting ways.

Library as community space
The future library can provide opportunities for the wider community to engage with the University and find out more about what goes on there. Public exhibition areas and displays, access to the Special Collections, library events, lectures, as well as use of the core library collection and the Makerspaces all provide opportunities for students from schools in the surrounding area to visit the university and get to know the place – potentially coming back as students later. Similarly, business mentoring and networking events may bring local and city businesses into the library to meet and interact with students and staff that may lead to research or employment opportunities.

3.5

Establishing a strategy for the development of the future library.

Establishing a strategy for the physical development of the future library – whether this involves a sequential renovation of library spaces, significant redevelopment of the existing library building or the construction of a new library – involves a sequential process. This is likely to include the following steps:

Establishing the vision and role of the library within the University's strategy
Exploring how the future library can best support the achieving of key institutional objectives such as enhancing the student experience, widening participation, delivering the curriculum, creating innovative learning and teaching approaches or enhancing the institution's research activities.

Identifying the future library model.
Understanding the vision for the future library within the context of broader campus development plans and digital strategy.

Establishing the functional brief for the future library.
This describes in detail the goals of the planned proposed project in terms of the vision and aspirations of the library in question, the activities that will take place in the library, and the spaces required to support those activities.

Identifying the physical opportunities and constraints impacting the future library.
An assessment of the building's current condition and the potential for re-use or the assessment of the potential site for a new library building, including the possible capacity of the site and massing within the context of the university's Campus Masterplan, Estates Strategy and Campus Development Plan.

Establishing the conceptual plan: matching demand and supply.
Bringing together the functional brief that describes the user requirements for the future library with the proposed outline strategy for the re-development of the existing building or construction of a new building to define the future library project. This will used to inform further design development, the development of a project implementation strategy and an assessment of project costs.

3.6

Developing the functional brief for the future library.

The functional brief describes, in detail, the goals of the planned proposed project in terms of the vision and aspirations of the library in question, the activities that will take place in the library, and the spaces required to support those activities. The functional requirements of each of the spaces is generally combined with a schedule of area requirements for each of the spaces and statements about the required adjacencies between these spaces.

Review of relevant university and library planning documents and strategies to determine impact on the future development of the library.

The future development of the library will take place within the context of a range of university strategies and policies including the overarching university strategic plan and other plans such as the library vision and strategic planning documents, and other strategics such as Widening participation, learning and teaching, research and innovation, digital, Indigenous students, community engagement strategies.

Review of existing library use data including student satisfaction surveys.

Analysis of data relating to use of the current library/ libraries including gate count, study seat use surveys, study room booking data, collection use statistics and student library satisfaction surveys

Library and campus-wide review of study space provision

A key element of many library development projects is the provision of additional, high quality study areas to support both individual and collaborative study. An analysis of existing study seats provision will provide data on the current balance between individual and collaborative study seats and the characteristics of each (open/ enclosed, furniture type, technology provision etc). If data on study seat usage is not available, observational studies can provide additional data about student preferences for study seat types.

Future provision of study seats in the library should, if possible, be considered in relation to overall campus-wide study seat provision. Many new campus building projects include areas of student commons/ informal learning and amenity spaces, and these can also be considered part of the available study seat provision.

Stakeholder mapping

Developing a stakeholder engagement plan to ensure that all relevant stakeholders are involved at the appropriate time in the development of the functional brief and the co-design of the future library. Stakeholders are likely to include university and library leadership, library staff, students, student organisations, Indigenous student groups and the wider Indigenous community.

Leadership discussions

Semi-structured interviews with library and university leaderships to clarify the vision, aims and objectives of the library development project and to explore how the project will contribute to the delivery of university and library strategic plans.

Precedent studies

Based on the project objectives and the previous experience of library staff and the appointed consultants advising the library, national and international library precedents can be identified that will inform the development of the functional brief and design of the future library. Depending on the scape of the project, data and photographs of the precedents can be gathered by desk research or through a series of library visits undertaken by a representative group of library staff and students.

Observational studies

A structured review of library space use at set times of the library day can provide valuable information about student preferences for study spaces as well as other spaces such as amenity and social spaces as well as information about the library entry experience, use of library service points and the journeys that students and staff make within the library.

Plan analysis of existing spaces

If reasonably up-to-date space plans of the library are available a plan analysis of the existing library building will provide useful data on the amount of space dedicated to the collections, study areas, student amenity spaces and staff workspace.

Staff engagement activities

Based on the initial stakeholder mapping a series of staff workshops can be used to explore the performance of the existing library and their needs and aspirations for the future library. Topics covered in these workshops will be, to some extent, dependent on the scope and scale of the library development project but they may include questions such as:

- What spaces/services work well in the current library, what doesn't work well and should not be part of the future library and what need to be improved?

- Where do you want the future library to be positioned in relation to benchmark institutions?

- How can the library deliver the best possible student experience?

- Where does the future library sit on the 'traditional to leading edge' continuum?

- What physical collection size should be accommodated in the future library?

- What is the role of the Special Collections in the future library?

- What student study spaces be provided in the future library

- What social and amenity spaces should be provided in the future library?

- How will the future library support post-graduate students/ researchers?
- How well do library staff workspaces support the way you want to work in the future?
- What spaces should be included to support cultural inclusion and how should these link to service delivery for these communities?
- How should the future library support the University's innovation and enterprise agenda?

Experience design workshops
Experience design workshops with a range of student groups, including First Nations, neurodiverse, LGBTQ+, undergraduate/ post-graduate/ HDR students, can be used to explore both the use and performance of the existing library but also their future needs and wishes for the future library in terms of both space and service delivery – both physical and digital. The User Experience (UX) engagement process may include library visits and the development of service and space prototypes as well as general discussion workshops.

First Nations engagement (within library/ wider community)
Alongside the user experience workshops, a First Nations cultural co-design strategy should be developed that details how the future library project furthers the University's Indigenous strategy and ensures that the library reflects Indigenous culture and knowledge and is welcoming to the wider Indigenous community as well as the students and staff of the university.

Design charette with library leadership.
The charette will review the 'headline big issues' emerging from the workshops and interviews and other data collection activities. The charette may also explore how well the building currently performs as well as the constraints and opportunities of the current building and the priorities and key design parameters for the future library project.

Based on the synthesis of all these activities the functional brief for the future library can be developed. This is likely to include:

- A statement of future library project vision, based on stakeholder engagement throughout the project.
- Outline review of existing library building
  - Building constraints and opportunities
  - Current space use
- Description of future library spaces
  - Library zones/ neighbourhoods
  - Study and research areas
  - Community/ social and well-being spaces
  - Technology and support spaces
  - Staff work areas and workplace model.
- Required space adjacencies.
- Outline schedule of areas for the future library
- Issues for further exploration/ prototyping during design development phase

3.7

Creating the future library: identifying the physical opportunities and constraints.

Many libraries are rethinking their spaces because of the opportunities offered by the reduction in the amount of space required to house the physical collection and the need to enhance the student library experience, supporting increasingly diverse study and research needs as well as addressing social and welfare requirements of students at all stages of their academic journey.

While some libraries are embarking on major new-build or redevelopment projects, other libraries are making incremental changes to their spaces and service offerings funded through small projects budgets or within general operating and maintenance budgets. In both cases, the question that must be asked is how these projects will enhance the future library's contribution to achieving the institution's strategic goals.

Stewart Brand's concept of shearing layers is relevant to considerations of how libraries can change and evolve over time. The concept was originally developed by architect Frank Duffy to describe how a building is composed of layers of change. Brand expanded the concept to six elements that all buildings have; with each one changing at a different pace: Site, Structure, Skin, Services, Space Plan, Stuff.

The Site, for example, never changes: a building is always situated in the same place. It's structure, also, is fairly stable but might see slow changes over time: removing a wall, adding an addition, etc.

Over the life of the building the skin – the façade and the windows – may be upgraded or replaced several times as requirements change, or the technical performance of components improves.

Similarly, the services layer is likely to be changed or adapted several times during the life of the building as air handling equipment, boilers and other plant items wear out or are no longer sufficient to meet the users' needs.

The space plan is easier to change and perhaps calls for more rapid variation: adding partitions, adding or moving furniture and rearranging spaces. Finally, the 'Stuff' layer is always in flux – the day-to-day changes made to spaces as people occupy them, moving furniture and adding or removing items from the spaces.

The core thesis of Brand and Duffy's work was that buildings are not finished once they've been "built" but rather they are always in a state of change, each layer moving at a different pace.[174]
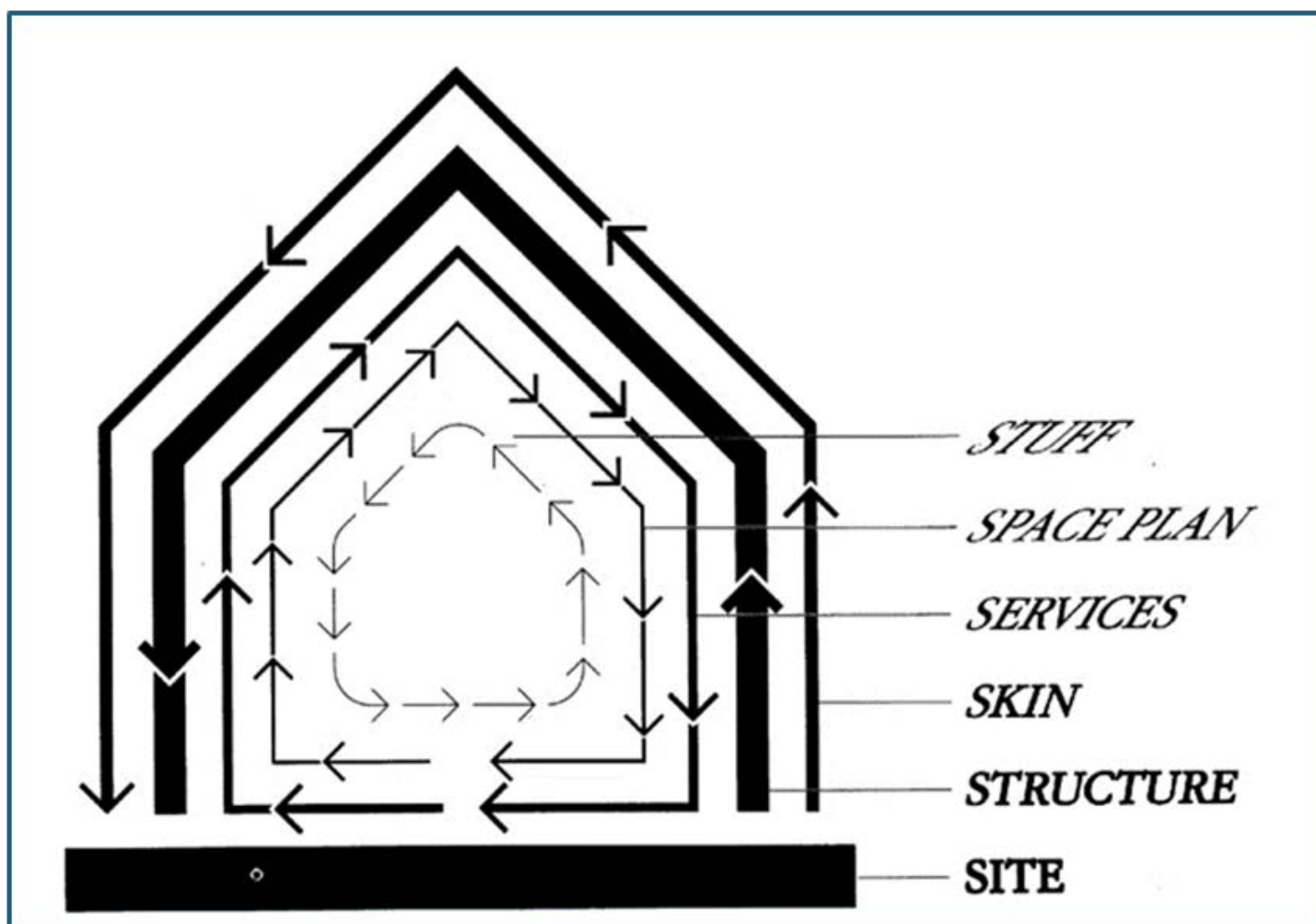
Stewart Brand. Layers of Change (after Duffy 1992). From: How Buildings Learn: What Happens After They Are Built (1994)

174 Fuller (2023)

Based on the discussions with libraries in this study it seems that many of the facilities that will be needed in the future library can be retro-fitted in existing buildings – library evolution at the level of the space plan and technology.

However, this evolution may be taking place within the constraints of aging building services, a building skin that, perhaps, does not deliver the future requirements for natural light and ventilation or thermal control and a structure that is not up to current seismic or fire standards or able to provide the sizes and qualities of spaces required to support changing user requirements. In these situations, a more detailed analysis of possible redevelopment options will need to be considered before investing further in the existing building.

This review is likely to include an assessment of the building's current condition and the potential for re-use undertaken by the appointed architect along with structural, façade, electrical, fire and hydraulics engineers. In this region of the world, the assessment of the building's seismic performance – and the work required to enhance this performance to the required level – is of particular importance.

Library development projects often include the re-purposing of spaces that had previously been occupied by library bookstacks to create student study spaces. This can significantly increase the number of people occupying areas of the library and a review of the fire strategy will be needed to determine whether the provision of escape stairs is sufficient for the increased population. If not, additional stairs will need to be retrofitted – adding significant cost to the project and potentially reducing the amount of usable area in the building.

A site analysis by the appointed architect will determine the opportunities for potential extensions to the existing library of, if a new library building is being considered, the capacity of the new site within the requirements stated in the Campus Masterplan, Estates Strategy and Capital Development Plan.

3.8

Putting it all together: matching supply and demand.

The design development process for the future library can be conceptualised as the matching of demand and supply factors. The diagram below is an adaptation of the 2010 diagram by John Worthington and Alistair Blyth from their book Managing the brief for better design. Blyth and Worthington make it clear that such a matching process must be based on a deep understanding of both sides of the demand and supply equation. On one side lie the learning community's aspirations, learning objectives and activities, together with the location of all the stakeholders (faculty, researchers, students, support networks). On the other, an appropriate set of physical and virtual learning settings based on factors such as the priorities for campus development, location, condition, building and space configuration and state of the services infrastructure.

The matching of demand and supply is seen as an iterative process with ongoing analysis of how the physical and virtual learning settings are supporting the learning process and the achievement of the educational goals. As needs change, so too must the combination of physical and virtual learning settings: the learning landscape must be agile enough to handle these changes. As Blyth and Worthington point out: 'The rate at which organizations change seems often to be much faster than the ability of the real estate to catch up' (Blyth and Worthington 2010: 12).

The understanding of user requirements for the future library takes place within the context of a broad range of university strategies and policies that may determine the priorities and direction of the library project including the institution's widening participation, Indigenous students, learning and teaching, research and innovation and sustainability strategies. Similarly, the analysis of the supply side – the existing library buildings and spaces or the site of a proposed new library – takes place within the context of the priorities and strategies contained in the university's campus masterplan, estates strategy and capital development plan documents.

Defining the future library: matching supply and demand.
© Warren and Mahoney (2024). After Blyth and Worthington (2010).

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