

The Future

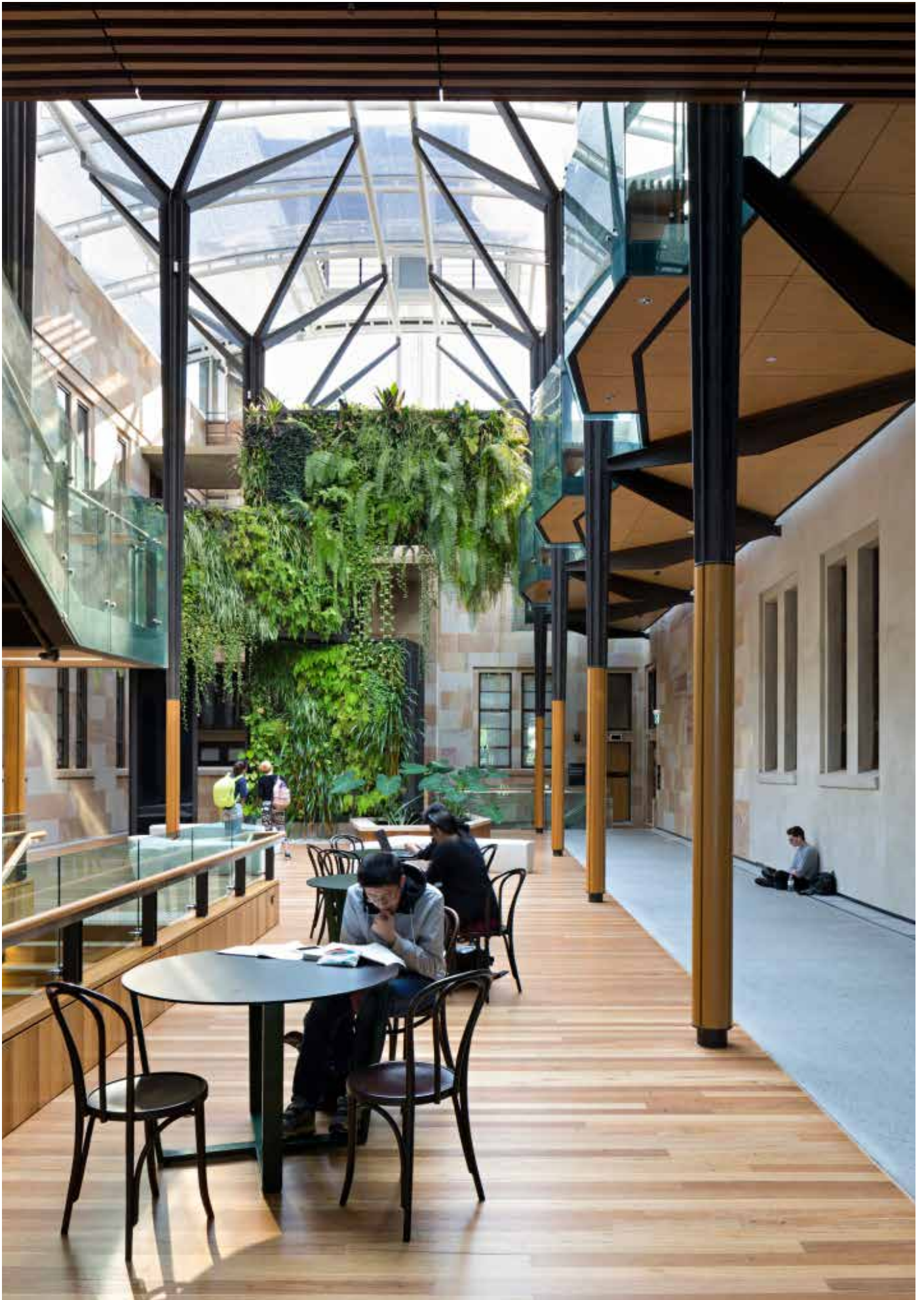
Academic Workplace

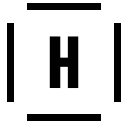
A Literature Review

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Section 1



INTRODUCTION

Open plan, or cellular offices for the academic workplace? That old chestnut! It keeps coming up because it's a tough nut to crack, and because inconsistent research findings allow everyone to defend their preferred option.

In the face of myriad pressures, many universities are adopting the more nuanced idea of a spectrum of choices within the workplace.

With an increased focus on collaborative and commercialised research, universities need to change their workplace practices, including a move to more open and activity based work environments.

Like all true dilemmas, finding a balance is the key, but just where the academic space sits along the spectrum of choices will depend on the nature of the institution and its work culture.

This report summarises research into the challenge of designing workplaces that support both solitary and team work.

And we conclude that a design that provides a choice of spaces for individual focus, informal communication, and collaboration is more likely to provide an effective and satisfying workplace than one that adheres doggedly to openness or enclosure.

The combination of spaces should deliver something for everyone - client, project manager, and end user.

QUT Creative Industries Precinct,
Brisbane, Australia
Photography by Peter Bennetts

OPEN PLAN OR CELLULAR OFFICES?

Research tells us that open plan offices can have both positive and negative effects on people. And some studies have conflicting conclusions on the relative importance of effects on productivity.

The either/or debate moves on

While the inconsistencies come from differing research approaches, there is also an element of incomparability between workplaces, because people and spaces vary so much. The complex interaction of these benefits and challenges has provided ample material for the debate to continue since the first workstations rolled off the production line forty years ago.¹

Most workplace research focuses on the individual comfort of open plan workspaces, and how this might affect productivity of the individual. Privacy (both visual and acoustic) is the most commonly cited problem in open plan workspaces.

A person's ability to control their working environment (through personalisation, temperature, ventilation, lighting etc.) also significantly enhances job satisfaction.^{2,3,4}

But that's not the whole story.

The influence of a work space on productivity depends on whether individual tasks or collaborative work is the focus of the research. For example, thermal comfort and light levels affect individual performance, but furniture layout, acoustics and group workspace affect team performance and collaborative tasks.⁵

With this in mind, the debate has shifted to the effectiveness of more open spaces on collective productivity; that is, the benefit to the team or business, as well as the individual.^{6,7}

The stakeholders in a new academic workplace project (university management, property department, and end users) may have different goals relating to productivity, work culture, job satisfaction

or professional identity, as well pragmatic concerns for space efficiency, maintenance, or the number of publications of a faculty.

University management may want closer collaboration with industry in short term projects, while facilities management seeks to increase density and space utilisation, and academics want secluded space to analyse their research and maximise their publication output.

This clash of priorities creates the all-to-familiar tension in the academic workplace design challenge.

Competing objectives are typified in the simplistic cellular office versus open plan workspace conundrum. Aligning goals (what do we want to achieve?), rather than desires (what space do I want?), is the delicate but important process.

1. The Science Place, James Cook University, Townsville, Australia

Photography by Andrew Rankin
2. QUT Creative Industries Precinct, Brisbane, Australia.
Photography by Peter Bennetts

The Future Academic Workplace



PRIORITIES HAVE CHANGED

Workplaces have evolved

The nature of the debate has changed over recent years because business cost rationalisation has adjusted focus from workplace densities and building costs to optimising employee effectiveness, at both individual and organisational levels. The evolution of the knowledge economy, demand for organisational agility and increased employee mobility are changing the workplace.

New workplace design needs to maximise the benefits of more interaction for the team while preserving the opportunity for individual focus. But providing a more open space can, but does not automatically, increase collaboration and communication, as conflicting research has shown.^{8,9}

Researchers from the Polytechnic Institute of New York, and IMD in Lausanne contend that the level of interaction depends on how space balances three dimensions that have both social and physical aspects:

- Proximity, where designs drive traffic to shared spaces and give people reasons to remain.
- Privacy, where people feel confident that they can converse without being interrupted or overheard.
- Permission, where company leadership and culture, as well as the space itself, conveys that casual conversation is encouraged.¹⁰

In the commercial sector, these ideas are reflected in the rise of flexible, or activity based working. In the academic sector, it may simply mean providing a diverse range of spaces, including individual territories, that allow users to choose between quiet, focused work, collaborative team work and social interaction as the need arises.

Flinders at Tonsley,
Flinders University, Adelaide, Australia.
Photography by Peter Bennetts



Higher education is changing too

The higher education sector is facing overwhelming technological, budgetary and organisational pressures.^{11,12} As higher education budgets are squeezed, space efficiencies become critical.

“When the annual cost of providing an office workplace can exceed the purchase price of a small car, the issue of value for money and stakeholder choice jumps sharply into focus.”¹³

Partnerships with industry and other institutions are transforming the nature of research, as well as the mobility and tenure of employees.

The ubiquity of mobile technologies has enhanced communication and access to information in a very short space of time. As a result, more effective workspaces for academic staff are high on the agenda for many educational institutions.¹⁴

A significant shift is already apparent in student facilities; collaborative learning spaces and social hubs are increasingly common on campus to cater for the changing teaching practices that have come with technological advancement.¹⁵

Space allocation per student in the United Kingdom has decreased in recent years, but as yet, the allocation for academics has not shifted considerably.¹⁴

Universities UK has undertaken an extensive review of the changes in the academic profession in response to the expansion of higher education generally.

With internationalisation comes greater mobility of students and staff, and collaboration with industry. The relevance of academic research is increasingly under scrutiny, both in the outputs of research and the processes by which it is produced.

“Academics themselves are becoming more internationalised, entrepreneurial and professionalised and their roles have diversified and often taken them away from the original disciplines towards new forms of identity and loyalty.”¹⁶

This internationalisation can be seen in statistics regarding co-authored publications. Between 2000 and 2013, the percentage of publications with authors from multiple countries rose from 13 per cent to 19 per cent,¹⁷ and in Australia between 2008–2014, more than half of Australian scientific publications had an international co-author.¹² But just working with more and other academics is not enough.

Looking to shift the burden of funding from the public to the private sector, and to boost the relevance and impact of research, governments are encouraging industry partners to form collaborative partnerships and translational research opportunities with universities.

Applied research as a proportion of all research at Australian universities is growing.

"Between 2000 and 2017, Australian private sector research funding increased by 90 per cent, to \$730 million."¹²

These partnerships, while valuable, bring with them inherent changeability in the size and nature of teams, projects, and funding. This, in turn, requires the universities to be more agile than ever before.

But changes to academic practices are not easy. The cellular office is a coveted and fiercely guarded territory. Universities that have trialled innovative spaces without cellular offices have had mixed success.

KNOWLEDGE WORK

The nature of knowledge work is that it combines high cognitive skills with social interaction. Knowledge workers need time to work alone to think, analyse and reflect, and time to interact with others so that ideas can be generated and evaluated.²

It follows then, that academics and researchers, knowledge workers by definition, need a combination of workspaces to optimise their work, with the right levels of proximity and privacy, coupled with the permission to converse.

Academia is one of the last bastions of cellular office work, lingering in many institutions at Stage 1 of the

evolution to flexible working, where employees have between 15 and 20 sqm of allocated space.

Others have bravely moved to Stages 2 and 3 with the more egalitarian approach of a standard 10 or 12 sqm per standard office.

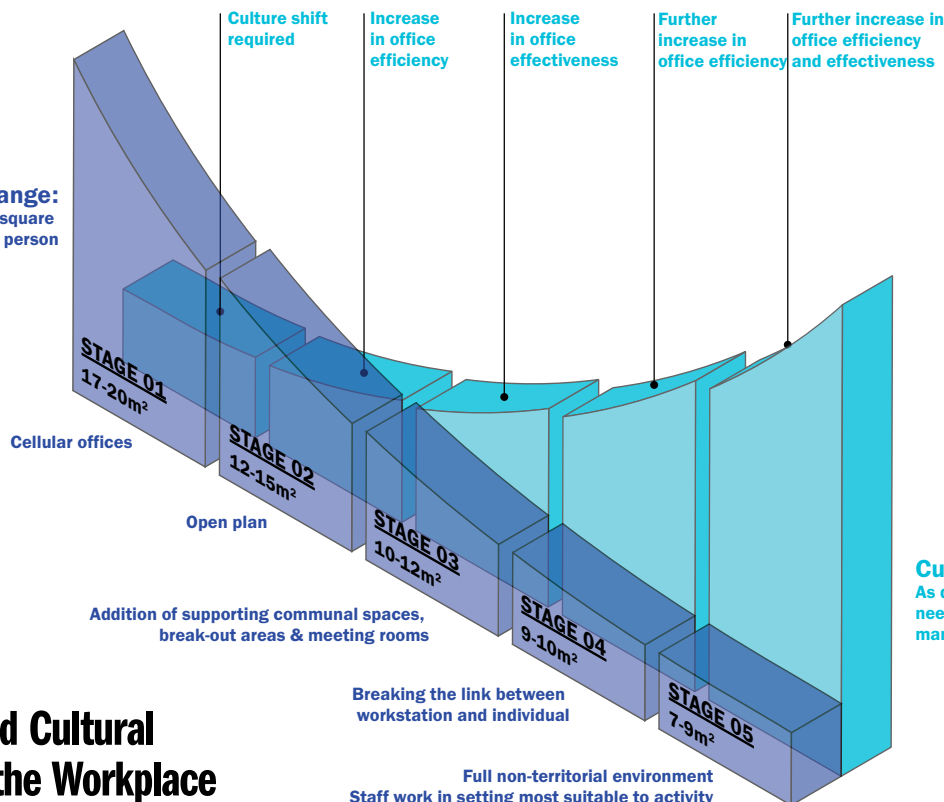
The glacial progress is due to a number of factors, including hierarchical structures, privacy and status concerns, work practices (varied tasks including teaching, researching, meetings and assessment) and the legacies of existing facilities.

Resistance is based on both real and perceived issues, and while

academic work practices have some specific differences, there are many similarities to the commercial workplace.

1. Flinders at Tonsley, Flinders University, Adelaide, Australia. Photography by Peter Bennetts
2. Melbourne School of Engineering, The University of Melbourne, Australia. Photography by Nicole England

Physical Change:
Office density in square metres per person



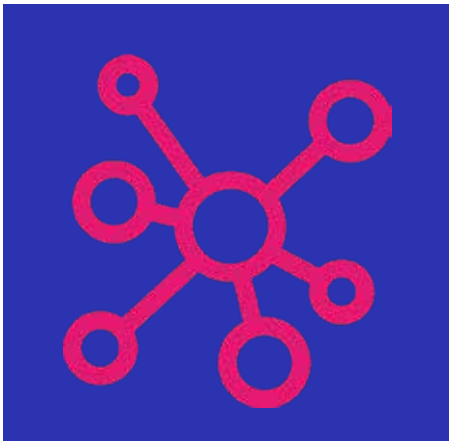
Cultural Shift:
As density increases the need for effective change management increases

Physical and Cultural Change in the Workplace

Working Beyond Walls, Gibson and Luck¹³

The Future Academic Workplace





45%
The average office desk is occupied for only 45 per cent of office hours.¹¹



Workers communicate three times more often in open plan spaces.²¹



UNIVERSITIES TESTING THE THEORY

The University of Melbourne School of Engineering has been piloting and, importantly, evaluating their staff experiences, in a new space that allows them to experiment with new work styles.

Running for a period of twelve months, several cohorts of academics, post-doc researchers and professional staff have trialled various combinations of allocated and unallocated desk configurations, with a view to honing the workplace strategy to enable the transformation of the faculty over the coming decades. The goal? More industry focus, more work-ready graduates, and more collaborative research.¹⁸

A study conducted by Loughborough University in the United Kingdom¹¹ examined various academic spaces, from individual office facilities to open plan and more innovative group centred research environments to explore shared work environments for academics.

There was widespread agreement amongst the researchers in the group centred environments that informal interaction with their colleagues was extremely valuable for their work. Overall, the group spaces were viewed positively, despite misgivings about privacy, noise and, in particular, hot-desking.

The study concluded that the trend for open plan work environments is slowly emerging due to pressure on

building costs, but perhaps more significantly, a growing recognition of the importance of interaction and collaboration between researchers.

At the Faculty of Architecture, Delft University, a post occupancy evaluation⁷ examined the response of academic staff to a new open plan workspace, with results similar to many other open plan workplace surveys - employees were dissatisfied with storage space, privacy, security and noise.

The conclusion that the space is, overall, a success is tempered by the fact that occupancy is still low at just under thirty per cent, and more people work more often from home.

These studies and built examples demonstrate that despite the common downsides to more open, group focused workspaces, the overall experience is generally considered to be positive.

With prototypes to work from, these universities are well placed to further develop appropriate strategies to deal with the challenges of acoustics and privacy, advance the ideas of space diversity in academic workspaces, and to readily identify where along the spectrum of workspace typologies they belong for any given building project.

1. The Science Place, James Cook University, Townsville, Australia. Photography by Andrew Rankin
2. Melbourne School of Engineering, The University of Melbourne, Melbourne, Australia. Photography by Nicole England
3. Deakin Prime, Deakin University, Melbourne, Australia. Photography by Shannon McGrath
4. Global Change Institute, The University of Queensland, Brisbane, Australia. Photography by Angus Martin
5. The Science Place, James Cook University, Townsville, Australia. Photography by Andrew Rankin

SELECTED PAPERS

Advantages of more open work space

Author	Findings
Knoll Inc ¹	Many studies show enhanced business performance for organisations that move from cellular offices to open plan environments, and contend that acoustic and privacy issues can be overcome in open plan environments with careful product selection and space planning.
Fayard and Weeks ¹⁰	Casual interactions among employees promote trust, cooperation and innovation. Spaces invite interaction only if they properly balance three affordances: Proximity, Privacy and Permission.
Arundell ²⁰	ABW workers had improved workday sedentary time, physical activity, job satisfaction and relationship with co-workers, and small declines in productivity. There were benefits to perceived organisational support for being active in the workplace, frequency of eating lunch with colleagues, and satisfaction with the physical environment in ABW compared to comparison participants. ABW employees associated ABW with greater opportunities for movement and collaboration, but had mixed views on the impact on productivity.
Boutellier, et al ²¹	Workers communicated three times more often in open plan, but the length of time of communication decreased, which in turn increased the amount of time available for working and thinking on their own.
Engelen et al. ²²	Activity Based Working has positive merit for interaction, communication, control of time and space and satisfaction with the workplace, but was unfavourable for privacy and concentration. It is a promising concept but should be supported with appropriate management support.
Maxwell ²³	People undertake individual tasks whenever and wherever they can: checking emails at home in the morning and using ipads and laptops in cafés and other places. Once in the workplace the majority of time is spent collaborating with others, whether it's a formal meeting or informal interaction
Oseland ²⁴	In a large international survey, landscaped offices (a variety of settings) and agile working, which are both types of "open plan", were more preferred than standard open plan and private offices. Home-working was rated highly whereas hot-desking was rated low. Participants in private offices preferred private offices, whereas those in open plan preferred open plan. It therefore appears that those who have not experienced open plan were more opposed to it, supporting a "fear of the unknown". Researchers preferred private offices, which could influence their studies of open plan. For all respondents, the most important workplace conditions related to flexibility.
Rashid ²⁵	The number of people visible while working had an important effect on the amount of face-to-face interaction that occurred in a workplace. This was more significant than the influence of the number of people moving through an area on face-to-face interaction. Most interpersonal interactions took place in individual workspaces.
Rothe ²⁶	Both open environments and more enclosed office concepts can be successful, or can fail. In the workplaces where the majority of respondents work in enclosed offices, individual employee Leesman Index scores (Lm1) ranged from 46 to 77, while the range for more open workplaces was 36 to 81. While most of the locations with an Lmi below 50 were predominantly open environments, so were the high performers. Of all the buildings with an Lmi of 70 or above, only 11 per cent were predominantly enclosed offices. There are good and bad workplaces and the reasons why can almost certainly not be pinned singularly on whether they are open plan or not.

Disadvantages to more open work space

Author	Findings
Jahncke ³	Different cognitive tasks need different settings – open plan environments have been shown to be detrimental to complex cognitive tasks (information search, recall, writing processes etc.) so it is important to consider which work environments are optimal for each kind of task.
Bernstein ⁸	This study empirically measured face-to-face and electronic interaction before and after the adoption of open office architecture in two offices. The volume of face-to-face interaction decreased significantly (70 per cent) in both cases, with an associated increase in electronic interaction. Rather than prompting increasingly vibrant face-to-face collaboration, open architecture appeared to encourage workers to socially withdraw from officemates and interact electronically instead.
Baldry ²⁷	Academics' social identity was based on an acceptance of the professional values of autonomy, collegiality and the tutor/ student relationship. Universities have previously been characterised by a high trust organisational culture. Many academics felt university governance is moving from high trust collegiality to low trust managerialism, and that this is reflected in the change from cellular offices to open plan workspaces.
Gensler ²⁸	The most significant factor in workplace effectiveness is individual focus work, not collaboration. Focus work occupied more time in the work day and was the activity people considered most critical to doing their job. Those findings “seem surprising given the emphasis on collaboration by many businesses, but work factors have changed: less space, less privacy, more time at work and more distractions are making focus work more important and time consuming.
Kim and de Dear ²⁹	Enclosed private offices clearly outperformed open-plan layouts in most aspects of Indoor Environment Quality, particularly acoustics, privacy and proxemics. Benefits of enhanced ease of interaction were smaller than the penalties of increased noise levels and decreased privacy in open plan configurations.
Mak ³⁰	Sound and temperature were the principal factors affecting office productivity. The three most annoying noise sources - conversation, ringing phones and machines - had a significant negative impact on all participants.
Pejtersen et al ³¹	Occupants sharing an office and occupants in open-plan offices (>6 occupants) had significantly more days of sickness absence than occupants in cellular offices.
Veitch ³²	Knowledge workers were more likely to perform at a high level in workplaces that supported visual and acoustic privacy. Access to private spaces promoted psychological comfort.
Yildirim et al ³³	Open plan office occupants may experience a lack of both visual and acoustic privacy in addition to an increase in unwanted distractions and interruptions, However, access to a window, with daylight and an outside view is beneficial to occupant satisfaction. Proximity to a window affects employee satisfaction, compensating for the negative aspects of open plan offices.

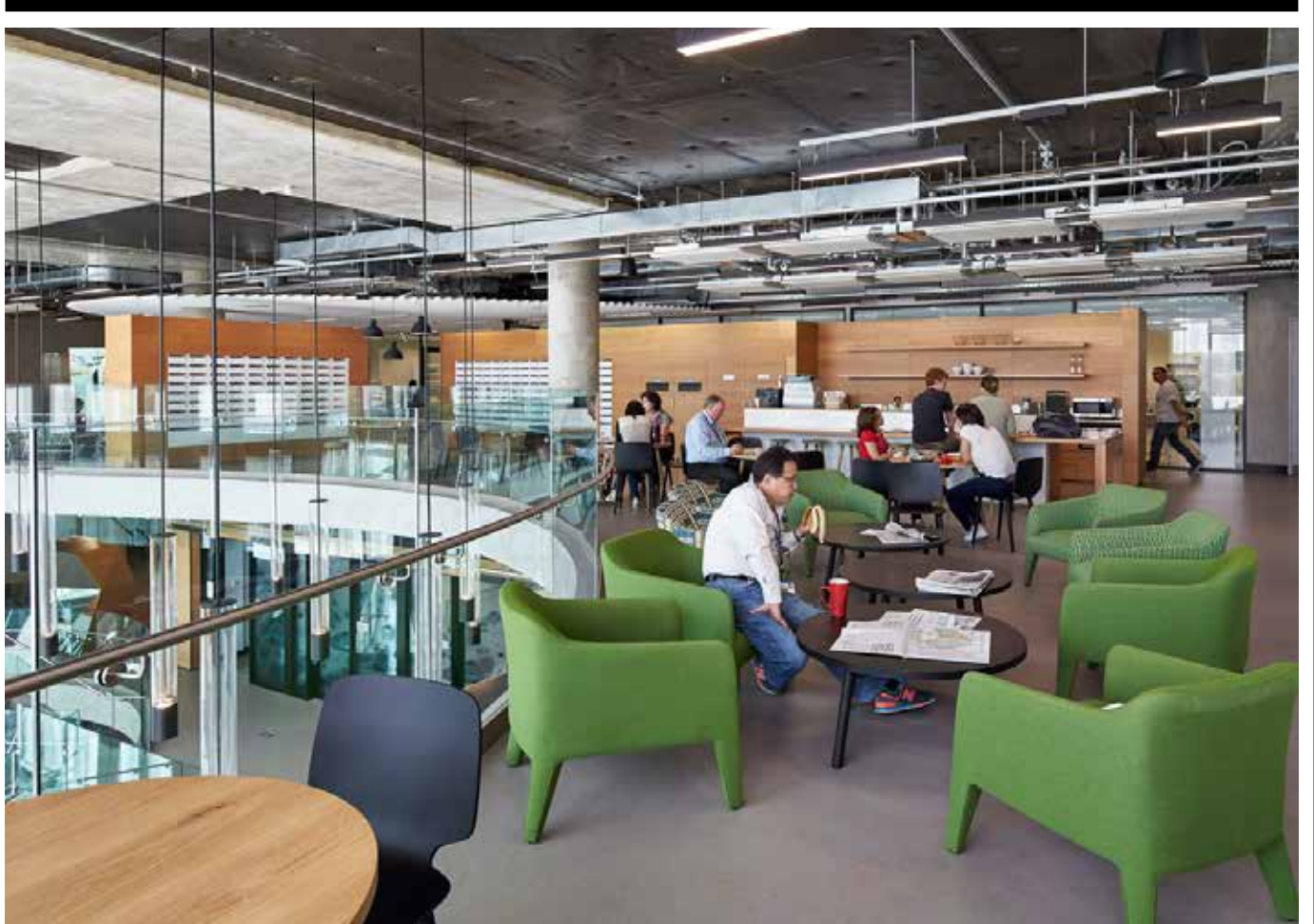
CONCLUSION

The results of the studies into academic space are in many ways similar to responses from the commercial sector, and while there may be peculiarities for the academic workspaces, in particular a need for privacy to talk to students, and for quiet space for complex cognitive tasks, the benefits and disadvantages of the open plan office appear to be universal.

As the landscape of higher education continues to transform, those universities willing to embrace the concept of choice in the workplace are more likely to be providing their academic staff with the spaces that will allow them to work effectively, not just efficiently.

Section 7





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1. Elisabeth Murdoch Building, The University of Melbourne. Photography by Dianna Snape.
2. Melbourne School of Engineering, The University of Melbourne. Photography by Nicole England

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1. Flinders at Tonsley, Flinders University, Adelaide. Photography by Peter Bennetts
2. Elisabeth Murdoch Building, The University of Melbourne. Photography by Dianna Snape

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