

Final Report 2011

A comprehensive learning space evaluation model

Lead institution

Swinburne University of Technology

Partner institutions

Victoria University

The University of Queensland

Project leaders

Nicolette Lee

Swinburne University of Technology

Dr Julie Dixon

Victoria University

Trish Andrews

The University of Queensland

Project team

Stella Tan

Swinburne University of Technology

Daniel Tout

Victoria University

Lorraine du Toit

The University of Queensland

Report authors

Nicolette Lee

Stella Tan

<http://www.swinburne.edu.au/spl/learningspacesproject/>

Support for this report has been provided by the Australian Learning and Teaching Council Ltd, an initiative of the Australian Government. The views expressed in this report do not necessarily reflect the views of the Australian Learning and Teaching Council or the Australian Government.

This work is published under the terms of the Creative Commons Attribution-Noncommercial-ShareAlike 3.0 Australia Licence. Under this Licence you are free to copy, distribute, display and perform the work and to make derivative works.

Attribution: You must attribute the work to the original authors and include the following statement: Support for the original work was provided by the Australian Learning and Teaching Council Ltd, an initiative of the Australian Government.

Noncommercial: You may not use this work for commercial purposes.

Share Alike: If you alter, transform, or build on this work, you may distribute the resulting work only under a licence identical to this one.

For any **reuse or distribution**, you must make clear to others the licence terms of this work. Any of these conditions can be waived if you obtain permission from the copyright holder. To view a copy of this licence, visit

<<http://creativecommons.org/licenses/by-nc-sa/3.0/au/>> or send a letter to:

Creative Commons
543 Howard Street, 5th Floor
San Francisco California 94105
USA

Requests and inquiries concerning these rights should be addressed to:

Australian Learning and Teaching Council
PO Box 2375
Strawberry Hills NSW 2012
Australia

Street address:
Level 14, 300 Elizabeth Street
Surry Hills NSW 2010
Australia

Telephone: 02 8667 8500
Facsimile: 02 8667 8515
Web: <www.altc.edu.au>

2011

ISBN 978-1-921856-54-9

Contents

1. Acknowledgments	1
2. Executive summary	2
3. Introduction	3
4. Approach and outcomes	4
4.1 The literature review	4
4.2 The model	4
4.3 Practice examples	5
4.4 Trial evaluations	5
4.5 Study of stakeholder perspectives	7
4.6 The website and toolbox	7
4.7 The seminar and workshop program	8
5. Findings	9
5.1 Challenges for the sector	9
5.2 Evaluations in the sector	10
5.3 Claims for learning and teaching	11
5.4 The trial evaluations	12
6. Dissemination and linkages	16
6.1 Dissemination of project outcomes	16
6.2 Links with previous ALTC projects and international projects	16
7. Evaluation and factors influencing the project	18
7.1 External evaluation	18
7.2 Evaluation of the workshop/seminar series	19
7.2 Selected factors influencing project outcomes	20
8. References	22
Appendix A: Evaluation of seminar and workshop series – questionnaire	23
Appendix B: Summary of dissemination activities	25

1. Acknowledgments

We wish to thank the following individuals and groups for their contribution and support in this project:

- the ALTC for funding the project and providing extraordinary support for its progress
- the individuals and institutions who have contributed case studies and evaluation instruments, too numerous to name here
- the staff at each of the partner institutions who volunteered their time and effort in contributing to this project through participating in our interviews, surveys and focus groups
- all of the participants in the seminar and workshop series around the country, who provided their insights and experiences and enthusiastically supported the project
- those who generously provided us with their time and spaces for the seminar and workshop events - Susan Sherringham at University of Technology Sydney Margaret Hicks and Ange McClelland at University of South Australia, Beverley Oliver and Barbara Whelan at Curtin University of Technology
- the keynote speakers at the Melbourne event for their time and efforts on our behalf - Jo Dane from Woods Bagot and Geoff Mitchell from Queensland University of Technology
- those who allowed us to visit their learning spaces during the Melbourne event - particularly Janice Coffey at Geelong Grammar School (Toorak campus) and Emma-Louise Lee at Deakin University
- members of the external reference group for their generosity of time and effort, particularly in the early stages of the project - Kate Wall and Pamela Woolner at the University of Newcastle, Mike Neary at University of Warwick, Mike Sharples at the University of Nottingham and Pratibha Varma-Nelson at Indiana University
- and Dr Peter Ling who generously agreed to commit his time and effort as an external evaluator to the project.



2. Executive summary

This document reports on the process and outcomes of the Australian Learning and Teaching Council (ALTC) funded project entitled 'A comprehensive learning space evaluation model'. Commencing in 2008, the project was carried out over a two year period by a project team based at three Australian universities: Swinburne University of Technology, Victoria University and The University of Queensland. The project team members were chosen for their collective expertise in education and evaluation, and for their leadership roles in campus development projects in their respective institutions. Each university also had an innovative space that was recently completed, creating an ideal partnership for the purposes of this project.

The project was designed as an investigation into the purposes, theory and practice of the evaluation of learning spaces in the university sector in Australia and beyond. There were three major strands of investigation. Firstly, a review of literature and practice in the evaluation of learning spaces, with a particular emphasis on the identification of models and methods in use, and the aims of those evaluations. To this end, we contacted over 100 institutions to ask for case-based examples of evaluations, and where available, the instruments that had been used. Secondly, the three institutional partners carried out trial evaluations of learning spaces. These evaluations covered three distinctive types of spaces, evaluation foci, and methods of investigation. Thirdly, an exploration of the degree of stakeholder ownership, and understanding of the evaluation of learning spaces. This last investigation was carried out through a series of structured interviews with stakeholders in each of the partner institutions.

Findings from each of these strands of investigation were published on the project website (<http://www.swinburne.edu.au/spl/learningspacesproject/>). Findings showed that institutions share a range of challenges in relation to learning space design and evaluation. Specifically: a lack of resourcing dedicated to comprehensive evaluations; sensitivity of evaluation processes and findings; a tendency to present spaces positively and without contextual information; limitations in understanding about the purpose and value of evaluation; limiting assumptions about the potential for input from a variety of stakeholders, and; the complex nature of evaluation itself. Further challenges to the sector arise from the lack of maturity in the field. In particular the lack of longitudinal and comparative research regarding the impact of campus design on learning and teaching practice. Advances in the proxies for student learning are required, as are more grounded studies identifying the relationship between spaces and behaviour.

Over the period of the project, it became clear that these concerns are shared across the sector, and that there are a number of groups working within institutions with these challenges in mind. We have also seen significant changes in thinking and a broadening of understanding of the nature of evaluation, including increasing concern with developing meaningful evaluation processes. This is likely, providing resourcing constraints are resolved, to result in improved rigour and reporting of evaluation processes and outcomes over the coming years.



3. Introduction

The proposal for this project was developed in response to a perceived gap in knowledge regarding the design and evaluation of learning spaces across the university sector in Australia. We argued that while there has been much attention to the design of learning spaces over recent years, evaluations of learning spaces have been limited in depth, rigour and theoretical grounding, and heavily reliant on informal or anecdotal evidence.

Learning spaces are a significant investment for institutions. Oblinger (2005) estimated that in 2006, \$US50 billion would be spent on physical facilities alone within US higher education (this figure excludes maintenance and upkeep of the facilities). The scale of such investment is unjustifiable without solid grounding for decision-making. Relatively little has been done to establish what might be appropriate methods of evaluation, or to form a solid theoretical or conceptual base for the design of campus spaces. In our original proposal, we also argued that the importance of “getting it right” in the design of learning spaces is not only financial. Learning spaces have a significant impact on the staff and students who use them. The experiences of users impact on their perceptions of the university environment and their capacity to work productively within it.

Existing literature demonstrates the potential value of evaluations. According to Lippincott (2007), design and pre-construction evaluations help to clarify the purposes of the building project and to understand the needs of all affected parties and users; evaluating the learning space once it is operational provides an opportunity to demonstrate how it is being used, identify unexpected uses, evaluate the value and effectiveness of the space, measure satisfaction of students and staff, and provide feedback for administration. While post-occupancy studies have traditionally focused on accountability from standard measures (eg frequency of use) or surveys of student satisfaction, Johnson and Lomas (2005) argue that these methods fail to deal with the broader claims for learning experiences. More recent evaluation studies have included psycho-social aspects of behaviour and environments (Hunley and Schaller, 2006), particularly the use of focus groups and observational methods to evidence the growth of learning communities within learning spaces.

The literature therefore points to the potential for evaluation to generate knowledge regarding the impact of learning spaces across a range of criteria related to design intent, cost, sustainability and user experience. This is increasingly important from the perspective of achieving maturity in our design processes and understanding the implications of design for achieving pedagogical goals, and for ensuring the significant financial investment in spaces is sustainable. This is by no means a simple task, given the range of stakeholder needs, shifting pedagogical and curricula drivers, and the paucity of theoretical and practical knowledge around design evaluation. In this project, we aimed to generate knowledge of evaluation models, methods and purposes, to locate and develop resources that would be of use to the sector and to individuals intending to carry out evaluations, and to facilitate a critical debate regarding the logistics, purposes, models and methods of evaluation of learning spaces in the university context.



4. Approach and outcomes

The project aimed to extend understanding of the processes and methods used in the evaluation of learning spaces, and to provide resources for the sector. In our initial proposal, we listed the outcomes of this project as:

- a literature review
- an evaluation model
- trial evaluations at each partner institution
- a study of stakeholder perspectives
- a website incorporating a 'toolbox' of methods and instruments from the sector
- a seminar/workshop series.

4.1 The literature review

An ongoing literature and practice review provided the basis for conceptual development grounded in data from trials and cases from around Australia. A meta-analysis of the current literature was also undertaken to identify categories for methods in use, contexts, driving decisions and claims. The literature review also covered the generic field of evaluation and participatory design methods. The summary of this literature review is available on the project website.

4.2 The model

The project proceeded from an assumption that the evaluation of learning spaces is of significant benefit to institutions and to those involved in the design of spaces in this context. We argued that the sector was demonstrating a strong interest in the development of spaces, but that there was little in the way of coherent conceptual or theoretical frameworks linking different types of evaluation.

Literature and practice reviews were significant activities in the project. Findings from these reviews led to the conclusion that evaluations are highly contextual. Evaluations, as we conceptualized them, are research processes in which each investigator draws on ontological, epistemological, methodological and theoretical or conceptual underpinnings, and designs the investigation in relation to the context of the study. As such, we found that a single model cannot provide the comprehensive basis for all evaluations. Rather, evaluations should take into account the purposes, space type and stakeholders relevant to each case.

As a starting point, we argued for a conceptualization of evaluation as part of a full cycle of space development. We proposed a baseline model of the development of learning spaces (Figure 1) that identified three interconnected stages of design, build and occupy, during which particular concerns were likely to be addressed by evaluation. This cycle presupposes a process of evaluation that is similar to that of the action-research cycle. Specifically, that each round of evaluation should inform subsequent stages, and subsequent projects, while taking into account diverse questions and contextual factors. Alongside this cycle, dimensions of stakeholder



ownership and needs were to be investigated. This model provided the basis for much of our ongoing conceptual discussions, presentations and consultations.

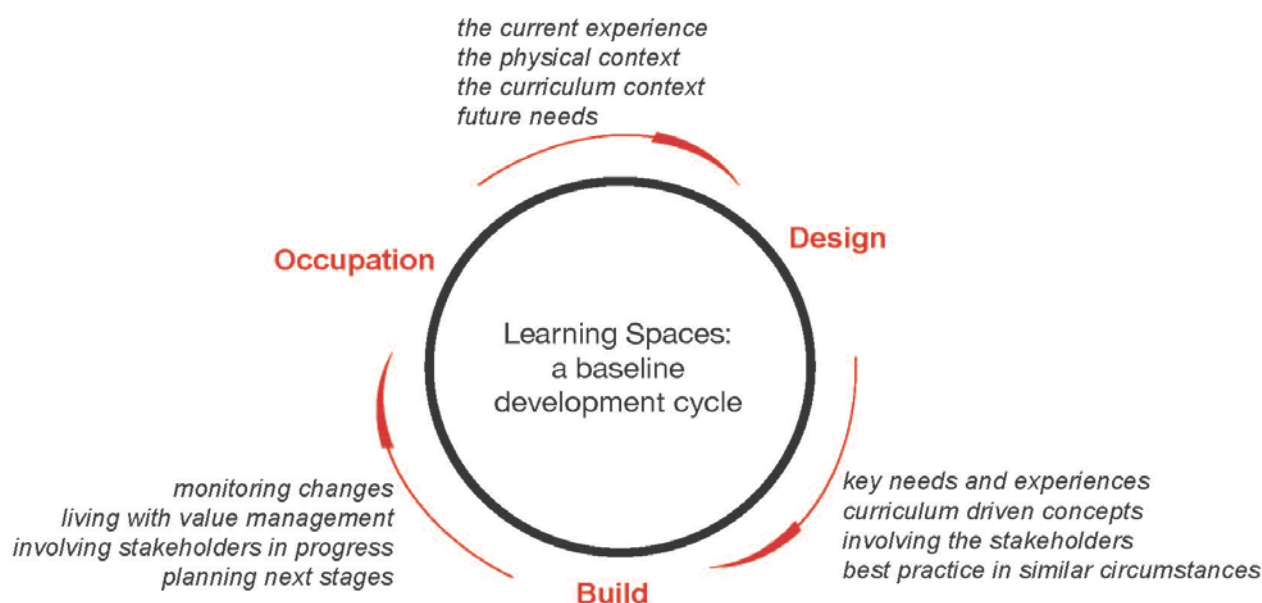


Figure 1: the baseline development model

4.3 Practice examples

In order to identify practical examples from across the sector, we made contact with over 100 tertiary institutions from Australia, the US and the UK. Using a pro-forma document, we asked each contact to complete a brief summary of the context, purpose and methods for evaluation. We also asked them to provide any findings that might be useful to the wider field, and where available, evaluation tools that might be adapted to other contexts.

This process raised several unanticipated issues. Firstly, that those involved in learning space design are not always visible, even within their own institution. Finding contacts was therefore more difficult than might be assumed. Secondly, that the sensitivity of evaluation methods and findings means that where we were able to identify individuals who might be able to provide examples, they were often unable to share information. Thirdly, that evaluations are often informal, and there was often little in the way of documentation available.

Nonetheless, we were able to gather 21 summary cases, and four sets of tools used at institutions. These were added to the project website as part of the 'toolbox' and are available for use by any institution or individual. We have asked that users contribute to the facility by returning any adapted tools with case studies of their own, acknowledging the original source and noting changes for context.

4.4 Trial evaluations

Using this early investigation into the contemporary theory and practice of evaluation, each institutional partner carried out a trial evaluation process. Each



study was unique in its approach to learning contexts and design aims: student-owned final year project spaces at Swinburne University of Technology, the information/learning commons at all library campuses at Victoria University, and spaces oriented to both teaching and independent learning with embedded technology at The University of Queensland.

Regardless of the conceptual model, methods and space evaluation focus for each institution, the overall process was the same in each case. That is:

- selection of representative stakeholder groups
- consultative process of identifying the purpose of evaluation, and selection of model and methods
- ethical approvals, data collection and analysis
- consultative review of findings with internal reference groups
- critical reviews of models, methods and questions in relation to the stated aims of the evaluation
- dissemination of findings within the institution for further application.

Throughout this process, four critical themes guided the process:

- imagining a process: Who is and will be engaged with the space, and what tensions arise from differing needs? How do we make the connections throughout the process so that each stage is informed by the previous?
- measuring: What do we evaluate against: previous facilities; state of the art; theoretical possibilities; objectives; intended or actual use; design criteria; student experience; and/or learning outcomes? Who should we be asking and what should we be asking?
- critiquing: How do we ensure that our initial assumptions about the way students will use a space and the impact on learning are not misdirecting our evaluation process to only give us the answer we want to hear? How do we accommodate the unexpected?
- closing the loop: How do we create recommendations from this knowledge that will inform future developments? Can we respond to these outcomes critically in order to improve the evaluation process itself? How do we disseminate this information to sustain a wider critical debate?

Each partner adopted different theoretical approaches to frame their study, and utilised unique combinations of methods for data collection and analysis. The final reports from these evaluations were published on the project website, comprising:

- a summary of the conceptual framework or model
- a critical review of the methods and tools
- the evaluation findings
- tools or instruments for data collection.



4.5 Study of stakeholder perspectives

The final strand of investigation was a study of stakeholder perspectives on the evaluation of learning spaces. Following ethical approval (gained at each institution), semi-structured interviews were carried out with stakeholder groups. Participants included:

- academic, facilities, library, IT services staff
- architects
- students.

Interviews covered questions regarding perspectives on levels of involvement, the purpose and value of evaluations, knowledge of evaluation processes, current ownership of the evaluation process and beliefs regarding evaluation participation and methods. The data from the interviews at each institution were then collated and analysed collectively to provide a single overview of the variations in perspective. A full summary report can be found on the project website.

4.6 The website and toolbox

(<http://www.swinburne.edu.au/spl/learningspacesproject/>)

The aim of the website is to provide a range of resources on the evaluation of learning spaces. The website has been progressively populated with information about and from the project, including:

- an overview of the project, project activities and team members
- details and links to each partner institution's trial evaluation space and summary reports from the trial evaluations
- summary stakeholder study and literature review reports
- a toolbox of case studies and evaluation instruments collected from both national and international institutions (instruments can be adopted and then re-submitted as further examples)
- details of the seminar and workshop series, including presentation documents and photographs
- links to useful sites on learning spaces, and partner institutions and organisations
- a list of publications and presentations
- a contact form for emailing team members about the project.

Over the past 12 months we have had a total of 844 hits (Google Analytics report, viewed 14 Dec 2010), out of which 673 hits were unique page views, averaging a time span of five minutes on each page. The most activity received on the website occurred between late July to September 2010, which coincided with the period the team were conducting seminar and workshop events around Australia. While activity on the website tapered after September, it is still generating more activity as compared to the earlier months between January to May 2010.



4.7 The seminar and workshop program

In 2010, a series of five seminar and workshop events were conducted at five states across Australia. A total of 150 participants attended these events. While the Queensland, South Australia and Western Australia events were held as one-day events, the New South Wales event was a combined two-day program with the second day delivered by the team from the ALTC-funded *Space Curriculum and Affordances For Future Oriented Learning Design* (SCAFFOLD) project. The final event in Victoria was hosted by Swinburne University of Technology, and run over two days. This extended event included two invited keynote speakers: Jo Dane from Woods Bagot Architects, and Geoff Mitchell from Queensland University of Technology, as well as visits to learning spaces at Deakin University, Geelong Grammar School and the Hawthorn Project Hub at Swinburne University of Technology.

A summary of the attendance for each workshop is given below:

	State	University	No. of participants	Date/time
1.	Queensland	The University of Queensland	23	1 day event
2.	New South Wales	University of Technology, Sydney	26	1 day event Day 2 SCAFFOLD event
3.	South Australia	University of South Australia	20	1 day event
4.	Western Australia	Curtin University of Technology	26	1 day event
5.	Victoria	Swinburne University of Technology	55	2 day event

Each of the one day events followed a similar program pattern, consisting of a series of presentations by the team facilitators, a presentation by the host university showing participants their learning spaces, and three different workshops on evaluating learning spaces, catering for different stages in development and/or areas of interest. Participants represented corporate architecture, tertiary and school sectors, and included library, educational development, facilities, information technology and academic staff. Full program details, presentation slides, workshop documents and photos of the learning spaces we visited are available on the project website. The feedback from these events is provided under Section 7 of this report: *Evaluation and factors influencing the project.*



5. Findings

5.1 Challenges for the sector

Lippincott (2007) recommends that overall, evaluation goals need to be aligned with the goals of the institution and accommodate the varying information needs of stakeholders. It would seem appropriate, then, that the wide range of stakeholders in learning spaces be involved in all stages of development. However this is not necessarily an easily achievable goal. University structures can introduce unexpected barriers to collaborative development and joint evaluation efforts. For example, departmental budgets and territories can delineate decision-making power within small groups, even when the outcomes have far reaching implications for the larger university community (Lee, 2007). Participants in both the stakeholder study and the workshops, and individuals from the sector, have indicated that there is little resourcing available for evaluation. They also reported that evaluations tend to be driven by individuals, in addition to their ongoing workload, and without any particular institutional support. These staff also often move on to other projects, either because funding for an evaluation has ended or because the level of work associated with devising and carrying out well-grounded evaluations is not sustainable.

Woolner et al. (2007a, 2007b) argue that ownership is one of the factors that may influence positive effects in the user – indicating that involvement in the design process by all stakeholders not only affects the relevance of the design, but also impacts on a positive cycle of outcomes and perceptions. We have found that those designing and evaluating learning spaces often have limited access to information from both a strategic and user perspective. This can mean that limited support is gained for design requirements by those most closely involved in using spaces, or that there is little shared vision around the design. We also found a tendency to gather feedback around functional aspects of the design, and to discuss design with staff and student users only at the post-occupancy stage. We argued strongly that staff and student users should be involved in the pre-design evaluation of learning spaces, and wherever possible in the design process itself. Post-occupancy is too late to be the first evaluation of whether a design will meet the needs of users. While we found that some individuals were making attempts to gather input from staff across departments, these attempts were often curtailed by time and resource constraints. In most cases, there was limited capacity to engage with multiple stakeholders. Only a few, from libraries, had been able to involve staff or students in meaningful discussion.

There are additional issues to resolve within the nuances of the institutional context, for example the high-level strategic drivers impacting on decision-making, of which many university staff may have only limited understanding (Hunter, 2006). Jamieson (2007) points out that the range of stakeholders represents a significant difficulty when designing learning spaces because they represent conflicting interests in how learning spaces are approached. Particular areas of tension may include levels of security versus open access, student use of technology versus internet management, integration and extension of services with the cost of those services. It is reasonable to conclude from this that future design and evaluation models of learning spaces should attempt to reconcile some of these tensions in order to satisfy the needs of both the institution and the users. Findings from stakeholder interviews reinforced these views. That is, while there are multiple potential stakeholders in the design and evaluation process, in practice, their participation is



very limited. Moreover, stakeholders found it difficult to imagine how the institutional patterns of working could be entirely overcome to enable greater or more meaningful collaboration and participation from representative groups.

While learning space design and evaluation is a complex and highly contextual challenge, and the problems and solutions of design and evaluation are not easily transferred out of context, lessons can be learnt regarding processes, methods and designs that afford particular activities that are common across institutions. Building on work done elsewhere will shorten the iterative design process and provide visual shorthand for communication between stakeholders, it also provides insight into the design possibilities. Too frequently, this kind of data is overlooked in the design stage, resulting in important lessons from other experiences being overlooked. We have advocated that institutions must share 'warts and all', with comprehensive information about the context, intent, design rationale, use, user groups, methods and findings. There are challenges here too—those involved in evaluation are usually also those involved in the design. Reputations, careers and future funding are often at stake. Institutions also promote spaces in relation to student experience, making this sensitive information. There is therefore a lot riding, both individually and institutionally, on spaces being successful. This is reflected in the very few institutions willing to provide full case studies for the project, and even fewer willing to share research instruments. It is also shown in the tendency for case studies to describe outcomes positively. As a result, we learn little about what works and what doesn't. This lack of capacity to publish detailed findings is implicated in the lack of availability of previous learning space evaluations.

Historically, cross-university competition is likely to have limited the information available around the outcomes of learning space evaluations where these have not been part of an academic investigation. As the field matures, it is hoped that a community of practice will emerge that enables testing of the methods of evaluation and the learning spaces themselves, as well as the sharing of findings. Nonetheless, during the seminar events there were clear indications from participants that they felt the lack of transparency to be inhibiting, and a felt desire to share information with one another. These are promising signs that the field is maturing and that those involved in the evaluation of learning spaces are increasingly passionate about evaluation and learning spaces and the knowledge that sharing processes, challenges and findings can provide.

5.2 Evaluations in the sector

We have advocated an approach to evaluation that engages with a full development cycle from concept, design, construction and occupation, and links these stages of learning space development to the generation of knowledge that informs subsequent developments. The field is as yet immature, with little longitudinal or comparative work being done across development stages within a project, or across projects. Relatively few people we interviewed had considered evaluation outside of post-occupancy. We found only two instances of evaluations linked over time, although feedback from the workshops indicated that there is increasing awareness of a need for more connected and developmental evaluation processes in addition to post-occupancy evaluation.

While we found little evidence-based, comprehensive evaluation occurring in the sector, where evaluation was occurring there were signs that those researchers are increasingly concerned with the rigour and relevance of their approach. In addition to the more typical survey methods, we found cases using narrative and



ethnographic inquiry, involving a range of methods including observational studies, video and protocol studies, diaries, movement tracking and group activities. The range of tools in use for evaluation demonstrates that researchers are seeking creative methods to gather data that provide the best fit for the questions at hand. While this has positive implications for achieving the kind of data that will support new understandings, it also means that few tools are used in more than one context, or tested in multiple evaluations over time.

In the literature and stakeholder study, we also found a tendency to assume that carry-over of designs and evaluation models from one context to another is desirable. While we argued that learning from examples was crucial, we were also concerned that there was an assumption that a space or an evaluation that worked in one context could be copied directly into another. This is not the case. The experience from our trial evaluation studies, the collected case studies and instruments, and the feedback from workshops provide clear evidence that evaluation is highly contextual and complex process. As Hunley and Schaller (2006) argue, 'results [from evaluations of learning spaces] can be mediated through a system that incorporates data gathered over time from multiple factors, multiple methods, and multiple sources' (p. 13.10). There are complex evaluation variables such as types and purposes of spaces, degrees and location of ownership, resourcing and scheduling constraints, access to participants, purposes and audiences. In each context, any evaluation model needs to be developed or adapted in order to meet the specific purposes, questions and participants, and resources, involved.

5.3 Claims for learning and teaching

Some authors have claimed learning outcome improvement as the goal of space design. The measurement of such concepts is proving a fairly intractable problem to solve in evaluations. There is ample evidence of the shifts in educational paradigms, resulting in a need to shift to matching learning spaces (Tom et al, 2008).

Demonstrating the worth of one design over another requires not only evidence that the original goals were worthwhile, but also that the rhetoric around student learning be empirically proven.

Johnson and Lomas (2005) argue that standard methods of evaluation fail to deal with the broader claims for learning experiences. Woolner et al (2007a) argue that although there is sufficient empirical evidence to show negative effects on learning, for example where sound or light quality is poor, there is little evidence that improvements on already reasonable spaces provide any statistically relevant improvement in learning outcomes. We also found that there are few empirically credible claims regarding student learning outcomes in the evaluation literature, with relatively poor proxies being used, such as satisfaction at first visit or anecdotal commentary by teachers.

Often-mooted methods for establishing impact on learning, such as the analysis of grades, do not hold up to critical assessment. In particular, the allocation of grades is carried out contextually, and can be influenced by the assessor's experience of teaching the group, normative processes, and adjustments to the way criteria are conceptualized. In our evaluations, several potential avenues for proxy measures were identified. Firstly, students responding to the Swinburne University of Technology survey were able to clearly articulate whether their learning experience and ability to work effectively had been positively or negatively impacted by the availability of the space, and the characteristics of its design. At Victoria University,



student rovers demonstrated qualitatively improving journal entries over the period of the study, indicating that their interaction with the space, the roles they were given, and the practice of participating in the study itself had an impact on their capacity to engage, reflect and record experiences.

A related claim made for new learning spaces is that they will impact on teaching paradigms. The Joint Information Systems Committee (2006, p. 30) states, “spaces are themselves agents for change. Changed spaces will change practice”. At The University of Queensland, staff participants certainly demonstrated learning in relation to changes in curriculum and pedagogical practice. As yet, there is little evidence in the field that long-term changes in practice are occurring, and there are no details regarding the interaction of space and teaching practice, curriculum and students. Rather, there is a tendency for designers and evaluators to work with early adopters of innovations, or to engage in experimental space-pedagogy development. In themselves these are useful activities. More work is needed on the long-term impact of a space to evaluate whether practices, perspectives and activities are changing over time, and whether the impact of a space change wanes over time, or if the space has inherent features that influence particular practices.

These findings indicate that there are ways to identify the impact on learning of spaces, albeit in early stages of maturity. There is far more work to be done evaluating the impact of space on behaviours, and the impact of behaviours on spaces. In other words, over the long term, after the training has finished, do staff continue to work in ways that are intended by the design of particular spaces, or do they adapt the spaces to their practice? There does appear to be potential for pedagogical and behavioural change in response to learning spaces. This is also linked to the impact of spaces on student learning. The capacity of students to achieve, and the learning itself, are influenced by a wide range of variables including teacher behaviours. Further work is required to unpack the ways in which spaces impact on learning, and whether the perceived impact is related to the space, newness of spaces, or other variables previously unconsidered.

5.4 The trial evaluations

The following describes in further detail each partner institution’s trial evaluation.

Swinburne University of Technology

Swinburne’s Hawthorn Project Hub is a learning space offering 24-hour, 7-day-a-week access to approximately 2000 students who are undertaking capstone subjects in the final year of their undergraduate degrees. At Swinburne, CIPP was used as the conceptual framework for the evaluation. CIPP is a generic project evaluation model that is structured around the domains of Context, Input, Processes and Product. The framework also emphasises a need to take into consideration multiple types of data collection over time, and across multiple stakeholder groups. The pre-design evaluation, undertaken between 2007 and 2009, comprised three strands:

- a study of student experience and perspectives around the Hawthorn campus experience
- a study of student perspectives on space needs for group projects
- a review of the implications of the implementation of project curriculum for all undergraduate students



Findings from these studies demonstrated unequivocally that the most important thing Swinburne could do to improve student experience in capstone projects would be to provide facilities dedicated to capstone projects, and industry focused group projects in particular. Early evaluation of the design and first use of the Hub involved data being gathered during the first months of occupation, regarding the experiences of departments such as facilities, Information Technology Services, and Security.

During the period of the project reported in this document, the focus was on post-occupancy student experience in the hub. This evaluation commenced in October 2009. The hub is a 'student-owned learning space' rather than a teaching space. As such, students were the main focus of evaluation. Multiple methods of data collection were used, specifically door counts, an online survey and a focus group. The online survey included both quantitative (likert scale) questions and qualitative (open response) questions. Findings from the evaluation were reported in the project documents and are available on the project website. There were some overall findings that we felt were potentially useful to the sector, particularly that:

- Students had a range of perspectives on particular types of spaces and furniture, indicating that there is no 'one size fits all' approach to learning space design, even where the activity is defined.
- Students perceived the exclusive nature of the space as representative of the value placed on their experience by the institution, and that there is therefore significant value in providing spaces that are dedicated to particular cohorts.
- There was a gender skew in respondents, and a need to carry out further investigation around whether aspects of space design impact on usage for particular groups of students.

Victoria University

Victoria University commenced redevelopment of several campus libraries into 'learning commons' in 2006. At the centre of the learning commons model has been the inclusion of the student rover program. This mobile peer learning support strategy was established as a potential means of fostering engagement amongst an increasingly diverse student cohort by helping to make the new learning commons more welcoming and less threatening for students.

The focus of the evaluation was the mediatory role that student rovers fulfill in interpreting, encouraging and facilitating learning practices and behaviours within the learning commons. The evaluation aimed to answer the following research questions:

- To what extent does the student rover program constitute an effective peer mentoring strategy, in which student rovers model and facilitate successful approaches to learning?
- To what extent do student rovers impact upon student experiences of and interactions with - or the functional operation of - the learning commons as learner- and learning-oriented spaces?

The evaluation has been conducted using what Kalikoff (2001, p.5) has termed a "mosaic" approach to evaluation, involving the implementation of a "series of evaluations that are textured, various, and complementary" in order to garner "reliable and detailed information". Focusing primarily on qualitative methods,



elements of phenomenological, ethnographic and participatory action research methodologies have been drawn upon, with data collection and analysis methods including quantitative statistics, participatory reflection, document analysis, online surveys, paper questionnaires, focus group sessions and exit interviews.

The research project is continuing in an iterative process, with the aim of capturing the impact of two new learning commons spaces, and to enable longitudinal evaluation of the impact of the student rover program. Further, as a result of the inherently complex areas of investigation and the volume of data collected throughout the course of the evaluation, analysis of qualitative data will continue. The following findings are based on both paper-based and online surveys distributed to students (n=807), staff (n=10) and student rovers (n=8) throughout 2010. Early findings from the evaluation suggest that:

- Students used the learning commons primarily to access the various technologies on offer and to make use of the quiet, individual study spaces provided within these spaces.
- Student suggestions for potential improvements to the learning commons focused on the provision of more of the above, with 30.9 per cent of student respondents requesting more or better access to technology and 21.8 per cent of respondents requesting more or better enforced silent study spaces.
- Many students' responses reflected more traditional modes of usage than anticipated, with qualitative comments suggesting that accessing books and other resources and studying quietly and privately were significant attractions bringing students into the learning commons.
- 78.1 per cent of students, 70 per cent of staff and 100 per cent of student rovers surveyed felt that the inclusion of student rovers within the learning commons model had improved the learning commons experience.
- Previous evaluative studies of the learning commons have recorded significant increases in door counts, student usage and user satisfaction since the design, development and introduction of the learning commons model (cf. Gallagher et al. 2008).

The University of Queensland

The University of Queensland aims to provide students and staff with a high quality learning environment that encourages independent learning and peer-to-peer interaction. Advanced concept teaching spaces intended for multiple uses form part of the academic facilities research and development strategy to meet this objective. The Advanced Concept Teaching Space (ACTS), opened in 2008, was designed to integrate innovative information technology and audio-visual systems into a contemporary lecture theater in order to facilitate active communication and interaction between students, instructors and their learning materials. The aim of ACTS is to provide a space in which technology-supported teaching practices to be trialed. The experimental nature of the space allows for evaluation of both technology and teaching practice to be evaluated with large groups of students.

Activity theory (Engström 2001) was used as the theoretical framework. Activity theory is a framework for interrogating the relationship between individuals and groups and their interactions with objects and the tools which are designed to assist in producing intended outcomes (Issroff & Scanlon 2002). We also took an illuminative approach to the evaluation. An illuminative inquiry presumes multiple



methods for collecting qualitative and quantitative data and takes account of the wider context of the object of study. The formal data collection methods used by The University of Queensland team included stakeholder interviews, class observations, an online user survey and administrative reporting systems for room bookings and staff training. This data was complemented with a meta-analysis of the individual evaluations of pedagogic trials in the space, content analysis of documentary and background sources along with more informal sources such as support requests and other feedback. The team applied activity theory as an analytic lens to examine these sources in evaluating ACTS as an experimental space.

This approach highlighted the diversity of stakeholders and expectations linked to experimental learning spaces. An important insight gained from the evaluation is that technology-rich spaces can be both enabling and constraining. Other findings from the evaluation include:

- several technological aspects of ACTS such as classroom management software and linking via internet and intranet to other learning spaces have proved to be successful and easily adoptable in other learning contexts including large lecture spaces
- the perceived professional 'finish' of ACTS was an important promotional attribute for students and staff as well as in marketing the university more generally
- new spaces create a need for lecturers to re-imagine their teaching. Appropriate change management strategies to support change practice are key to successful integration of the innovative spaces
- students arrive in advanced teaching and learning spaces with different expectations and skill sets. Appropriate preparation for students needs to be addressed in the learning design for courses taught in innovative spaces
- the needs and constraints faced by teachers and students embedded in different disciplinary discourses and organisational units are diverse. How research, teaching and pedagogic research activities are interpreted and weighted matter for advancing teaching and learning practice
- administrative and organisational support systems at several levels are also implicated in uptake and experience of old and new spaces within the campus and more broadly in the university.

There is both the need and space for more active engagement from academic stakeholders in the analysis and imagination, not only of what is going to or may happen in new spaces, but also who is likely to use the space, and what constraints they operate within. This calls for an integrated but broad-based approach to imagining future learning landscapes.



6. Dissemination and linkages

Our project outcomes are designed to be applicable to implementation to any institution, both nationally and internationally, addressing issues on evaluating learning spaces. The project was also designed around a dissemination model in which the team was highly active across the sector, sharing ideas and identifying individuals with interests in learning space evaluations. The team also provided consultation and advice to individuals at a number of institutions, and provided workshops, on a regular basis throughout the project. Recommendations from the project have been implemented at several universities, both in Australia and internationally.

6.1 Dissemination of project outcomes

Over the span of the project, we received close to 20 requests for advice and further information on evaluating learning spaces through the website. Many of those contacts have resulted in successful discussions and collaborations on evaluating learning spaces. Representatives from Monash, Deakin and Melbourne Universities visited Swinburne to discuss the project and have been provided with information about possible evaluation methods. Staff from the University of South Australia have also contacted Swinburne for advice regarding their evaluation of a new engineering space. Monash University staff said that they would like to use our evaluation methods as a comparative trial for library spaces in 2010. Swinburne student reviews of RFID tracking methods (the use of electronic tags to view student or object movement through a space) have also been shared with other institutions, resulting in staff from the Monash Education Centre investigating their use for evaluating student preferences and usage.

The team have presented and published on the project processes and outcomes over the period of the project. A summary list of presentations, journal articles, workshop and consultation activities is provided as [Appendix B](#). These dissemination activities appear set to continue into 2011 and beyond. The team leader has been invited to present on the topic of project curriculum and spaces as transitional environments at Kingston University, London in 2011, and the team have received invitations to speak at various Australian conferences over the coming year. We also continue to receive invitations to speak at conferences on learning space development, and to receive requests for advice and information regarding current practice. While workshop participants also suggested that they would like another seminar/workshop series in 2011, building on the 2010 series, this looks less feasible to arrange because of the nature of institutional funding. The requests nonetheless indicate that there is much still to be done, and high levels of interest in the sector for more work of this nature.

6.2 Links with previous ALTC projects and international projects

Wherever possible, we have built on previous projects and collaborated with teams both nationally and internationally. On a national front, we consulted with the Next Generation Learning Spaces project team at The University of Queensland early in the project. Derek Powell, the leader of that project, was also a member of the external reference group. We also had discussions with Geoff Mitchell at Queensland University of Technology, the team leader for the ALTC-funded 'Retrofitting university learning spaces: From teaching spaces to learning spaces'



project. Geoff was also a keynote speaker at the seminar and workshop event in Melbourne. The team also collaborated with the SCAFFOLD project at University of Technology, Sydney in creating a joint seminar and workshop event.

Internationally, the team leader of our project visited the University of Newcastle (UK) research group working on learning spaces in schools, (CfLAT Research Centre for Learning and Teaching), resulting in a reciprocal partnership sharing learning space evaluation methods. We also consulted with, and visited, teams at Warwick University and Aalborg University regarding their learning space projects. In addition, the team also held discussions with the JISC (UK) team working on a project on the evaluation of learning spaces. In early 2010, representatives from the JISC directorate also visited Swinburne to take part in discussions about project processes, outcomes and potential future collaborations.

In addition Victoria University staff and student representatives were members of the reference group for the ALTC funded project 'Spaces for Knowledge generation: a framework for designing student learning environments for the future'. In this capacity they contributed to a series of forums examining the way learning is constructed within redesigned spaces.



7. Evaluation and factors influencing the project

In the first year of the project, we implemented an external reference group with whom we shared progress and asked for feedback on a regular basis. While this process generated useful discussions across the sector, feedback from the general dissemination activities, including presentations, consultations and the website, provided the most valuable evaluative process. At each institution, team members also established an informal internal reference group made up of stakeholders. At Swinburne, two additional groups were brought together: a student committee who provided feedback on the institutional trial, and a management committee who provided feedback on the overall project process, evaluation methods and findings.

7.1 External evaluation

An independent evaluation of the project was carried out by Associate Professor Peter Ling. In line with ALTC reporting requirements, a copy of the independent project evaluation report was submitted to the ALTC. The summary of this evaluation reads:

The project Evaluation of Learning Spaces substantially achieved the outcomes and produced the deliverables proposed. There were some variations from the proposal. In particular multiple models for evaluation of learning spaces were produced rather than a single model as it was realised early on in the project that no single model of evaluation of learning spaces could cover all situations; models need to be adapted to purpose and context. For similar reasons, rather than producing a single toolbox for evaluation of learning spaces a variety of evaluation approaches was provided through online case studies, some of which included evaluation tools.

The project organisation and communication processes worked effectively. There were some initial difficulties in retaining support staff. Two key team members experienced accidents that interrupted their contributions. Nevertheless the project was completed in a timely manner thanks to the project team and project officers' commitment. The reference group proved difficult to operate in the manner intended but alternative forms of stakeholder and national and international expert input were adopted and were effective in informing the project.

Dissemination has been a strong point of the project through related publications, conference papers and a highly successful seminar and workshop series conducted in the mainland state capitals and the deployment of a comprehensive project web site.

There is a demonstrated demand for the continuation of activities related to the project and ongoing opportunities for involvement of the team. There is also a commitment to maintain the web site.

Overall the project team – Nicolette Lee, Trish Andrews and Julie Dixon – are to be congratulated on producing well-received deliverables within the timeframe of the project and in the face of some difficulties. The final project support team – Stella Tan, Daniel Tout, and Lorinne du Toit – played a critical role. They demonstrated expertise, commitment and initiative.



This project has already had a significant impact on evaluation of learning spaces in the institutions involved. Beyond this it has influenced decision making in other universities nationally and internationally and its reach has gone beyond the higher education sector.

7.2 Evaluation of the workshop/seminar series

At each event we asked participants to provide feedback via an evaluation questionnaire, consisting of nine likert and open text response questions (provided in [Appendix A](#)). The aim of the questionnaire was to gain feedback from participants regarding how well the event was organized, whether they learnt anything from the seminar and workshops, and if there was anything they wished to comment or suggest for future events by the team. We received a total of 79 returned evaluation forms from the participants.

Summary of likert scale data:

Q1. The workshop was well organized:				
Strongly Agree: 58	Agree: 21	Disagree: 0	Strongly disagree: 0	Unable to judge: 0
Q2. The ideas presented and discussions were interesting and engaging:				
Strongly Agree: 52	Agree: 26	Disagree: 1	Strongly disagree: 0	Unable to judge: 0
Q3. The presenters communicated information and ideas clearly and effectively:				
Strongly Agree: 54	Agree: 25	Disagree: 1	Strongly disagree: 0	Unable to judge: 0
Q4. Do you feel that your knowledge has been extended within the area of learning space evaluation?				
Strongly Agree: 44	Agree: 35	Disagree: 0	Strongly disagree: 0	Unable to judge: 0

Overall, participants felt that it was a timely and well-organized event (100 per cent agreement), and that the discussions were interesting and engaging (99 per cent agreement). In addition to the likert responses, some participants added comments to that effect:

Many thanks for organizing this event. It was very useful to hear about the research in the area, as well as case studies and other people's experiences and practices.

Day was excellent. Very interesting presentations that opened my eyes to the complexity of evaluation and to the theoretical literature published on evaluation

Thanks so much for a really professionally organized and well-considered 2 day seminar. It was better organized than many conferences for which I had paid big bucks. Great to share with and hear from the people involved.



More than 50 per cent of respondents (n = 44) indicated that they had come to the event without much knowledge about the need for evaluating learning spaces, but had gained new understanding and were motivated to provide feedback to their departments and managers about the importance of evaluating their learning spaces. In particular, comments indicated that participants had understood the developmental cycle of evaluation and intended to make use of this new knowledge:

Reminded me that we have to evaluate spaces prior to change.

Incorporate a variety of evaluative activities in an upcoming learning space development – something we haven't done previously – pre-design and post-occupancy in particular.

Evaluation needs to be considered at the beginning of the project and all the way through.

Participants also responded to questions regarding shifts in thinking with comments related to the use of more rigorous and creative methods, and the greater involvement of stakeholders:

The workshop has given us some fantastic ideas for gathering evidence, some of which we will definitely put into place when designing our latest learning space.

Closer work with academics to design spaces that are relevant and useful for students trying to complete their assignments.

Further comments suggested that some participants had also developed a more constructive perspective on evaluation that would enhance transparency and rigour in their evaluation processes:

...has shifted my thinking in regards to viewing negative feedback – taking it as constructive and viewing it as the next step in the 'process', rather than seeing it as damaging to reputation or self-esteem.

Discussion about the myths or claims that underpin our practice, that determine our approach but that we never really try to question or 'unpack' where the evidence is? What are we trying to achieve? What do stakeholders want?

When asked for suggestions for future events, participants said that they would like to see more in-depth sessions of the same topic areas and extending on the project. They also suggested an annual event on evaluating learning spaces, as well as a peer reviewed journal.

7.2 Selected factors influencing project outcomes

Key factors that contributed to the success of the project were:

- clear project objectives, goals and deadlines
- clear roles and responsibilities for each of the project team members
- strong project management, including monthly project status reports, schedules and reminders



- having online and sharable databases such as Mendeley and Google calendar to share resources and to be able to keep track of major deadlines.
- a supportive and collaborative team environment, including regular communications via email, phone and video call to identify potential problems early
- commitment and enthusiasm of each team member, enabling barriers, delays and challenges to be overcome
- flexibility to work around problems and overcome challenges through collaborative support
- opportunity to interact and engage with a variety of interest groups in the field
- support from the sector and beyond, in particular the generosity of participants in completing case study documents, sharing tools and engaging in conversations
- extraordinary support from institutions across the states who generously hosted our seminar and workshop events.

Key inhibiting factors that the project team experienced were:

- allocating sufficient time to the project, and in a cross-institutional project, matching schedules to ensure communications and common activities can be achieved
- unforeseen circumstances such as health problems impact the timeline of the project. In 2010, two team members experienced serious illness and were unable to work for several months. These challenges were overcome through constant communication, employing additional short term support staff and a great deal of flexibility about allocation of tasks and scheduling
- a high rate of staff turnover – at Swinburne, two project managers left to take up full time, ongoing roles at other universities. Similarly, over a six month period The University of Queensland also had three research assistants, with staff leaving to take on ongoing roles, travel or commence PhD scholarships. Victoria University also had changes in research assistants, and for the last few months of the project was without a research assistant for similar reasons. This meant, that significant time is spent in the recruitment process, with associated time lags for each new staff member in developing sufficient knowledge of the project and work to date before becoming productive
- working across the three national institutions has presented some unexpected challenges. Delays were experienced with legal and financial agreements, and significant delays were experienced with ethical approval. In particular, ethics committees appeared to have some difficulty understanding the relationship of the ALTC to the project, and the relationship of research studies to the overall project.



8. References

- Bennett, S 2006, The choice for learning, *Journal of Academic Librarianship*, vol. 32, no. 1, pp. 3-13.
- Engestrom, Y 2001, Expansive learning at work: toward and activity theoretical reconceptualization, *Journal of Education and Work*, vol. 14, no. 1, pp. 133-156.
- Gallagher, A, Pearce, A & McComack, R 2008, Learning in the learning commons: the learning commons at City Flinders and St Albans campuses, in D Radcliffe, H Wilson, D Powell & B Tibbetts (eds) *Proceedings of the Next Generation Learning Spaces Colloquium*, University of Queensland, Brisbane, pp. 99-106.
- Hunley, S & Schaller, M 2006, Assessing learning spaces, in D Oblinger (ed) *Learning Spaces*, Educause, Boulder, CO, Ch. 13.
- Hunter, B 2006 The Espaces Study: designing, developing and managing learning spaces for effective learning, *New Review of Academic Librarianship*, vol. 12, no. 2, pp. 61-81.
- Issroff, K & Scanlon, E 2002, Using technology in higher education: an activity theory perspective, *Journal of Computer Assisted Learning*, vol. 18, no. 1, pp. 77-83.
- Jamieson, P 2007, Rethinking the university classroom: designing 'places' for learning, paper presented at the *Next Generation Learning Spaces Colloquium*, University of Queensland, Brisbane.
- Johnson, C & Lomas C 2005, Design of the Learning Space: learning and design principles, *Educause Review*, vol. 40, no. 4, pp. 16-28.
- Joint Information Systems Committee (JISC) 2006, *Designing spaces for effective learning: a guide to 21st century learning space design*, Higher Education Funding Council for England (HEFCE), Bristol.
- Kalikoff, B 2001, From coercion to collaboration: a mosaic approach to writing center assessment, *The Writing Lab Newsletter*, vol. 26, no. 1, pp. 5-7.
- Lee, N 2007, You want me to do what? Implementing professionally-focused, project-based learning across disciplines, paper presented at the Higher Education Academy Annual Conference. Harrogate.
- Lippincott, JK 2007, Assessing learning spaces, paper presented at the *Library Assessment Conference*, Charlottesville, VA.
- Oblinger, D 2005, Leading the transition from classrooms to learning spaces, *Educause Quarterly*, vol. 28, no. 1, pp. 14-18.
- Tom, JSC, Voss, K & Scheetz, C 2008, The space is the message: first assessment of a learning studio, *Educause Quarterly*, vol. 31, no. 2, pp. 42-52.
- Woolner, P, Hall, E, Higgins, S, McCaughey, C & Wall, K 2007a, A sound foundation? What we know about the impact of environments on learning and the implications for building schools for the future, *Oxford Review of Education*, vol. 33, no. 1, pp. 47-70.
- Woolner, P, Hall, E, Wall, K & Dennison, D 2007b, Getting together to improve the school environment: user consultation, participatory design and student voice, *Improving Schools*, vol. 10, no. 3, pp. 233-248.



Appendix A: Evaluation of seminar and workshop series – questionnaire

Evaluating Learning Spaces

Survey Feedback Form

Thank you for your participation in this event on evaluating learning spaces. We would appreciate your assistance in completing the following evaluation. Your feedback will assist us in the development of future similar events.

Which day(s) did you attend?

- Day 1 Day 2

The seminar and workshop was well organised

- Strongly agree Agree Disagree Strongly disagree Unable to judge

The ideas presented and discussions were interesting and engaging

- Strongly agree Agree Disagree Strongly disagree Unable to judge

The presenters communicated information and ideas clearly and effectively

- Strongly agree Agree Disagree Strongly disagree Unable to judge

Do you feel that your knowledge has been extended within the area of learning space evaluation?

- Strongly agree Agree Disagree Strongly disagree Unable to judge

Identify one or more ideas that you might implement in your design/evaluation of your learning space



Identify one experience from the workshop that has shifted your thinking

Please indicate which sessions you felt were the most valuable:

- Keynotes Presentations Learning space tours Workshops Discussions

Do you have any suggestions for additional sessions conducted by the Learning Spaces team?

Do you have any further comments?

Thank you for providing feedback. Please pass the completed form to one of the facilitators.



Appendix B: Summary of dissemination activities

Presentations and journal articles

- Andrews, P 2010, Reimagining teaching for technology enriched learning spaces. *Informa Learning Spaces Design Forum*. Sydney.
- Kirkwood, K, Best, G, McCormack, R & Tout, D, in press 2011, Student mentors in physical and virtual learning spaces, in M Keppell, K Souter & M Riddle (eds), *Physical and virtual learning spaces in higher education: concepts for the modern learning environment*, IGI Global, Hershey, PA.
- Lee, N 2009, Get of out my space: designing a curriculum-led, non-teaching, learning space, in *Proceedings of The Fourth Symposium on Social Learning Space: Learning Outside the Square*, Oxford, Oxford Brookes.
- Lee, N 2010, Learning commons by design. *Learning commons development and design forum: the new pedagogy*. Informa, Melbourne.
- Lee, N, Dixon, J & Andrews, P 2009, Evaluation of learning spaces: poster presentation at *Educause Australasia*. Perth.
- Mazzolini, N & Lee, N 2010, Designing and evaluating informal learning spaces intended to support project-focused learning in a highly constrained campus environment, paper presented at the *Problem-based Learning Conference*. Aalborg.
- Pancini, G, McCormack, R & Tout, D 2010, Do students employed to help other students learn also learn to work? *WERC Circle*. Melbourne.
- Pancini, G, McCormack, R & Tout, D 2010, Do students employed to help other students learn also learn to work? *AVETRA Conference 2010 - VET Research: Leading and Responding in Turbulent Times*. Surfers Paradise.
- Steel, C & Andrews, P 2010, Re-imagining teaching for technology-enriched learning spaces in Keppel. in M Keppell, K Souter & M Riddle (eds), *Physical and virtual learning spaces in higher education: concepts for the modern learning environment*, IGI Global, Hershey, PA.

Seminars and training

In addition to the seminar and workshop events held across Australia, additional seminars were presented during the course of the project, including:

- Lee, N 2009, Issues in designing learning spaces, Warwick University.
- Andrews, P 2009, German Secondary School Teachers: Introduction to the Collaborative Teaching and Learning Spaces at UQ.
- Andrews, P 2010 Thai Directors of Education Bureau: Introduction to the Collaborative Teaching and Learning Spaces at UQ.
- Andrews, P 2010 Chinese Secondary/Vocational Education teachers from the Hangzhou Municipal Education Bureau: Introduction to the Collaborative Teaching and Learning Spaces at UQ.



Consultations

Throughout the period of this project, we held discussions and provided consultations on the evaluation of learning spaces to individuals from a wide range of organizations, and often several from different departments in the same university. These included:

Aalborg University (DK)

Bialik College (Vic)

Curtin University of Technology

Deakin University

Kingston University

Macquarie University

Monash University

Queensland University of Technology

Royal Children's Hospital

Royal Melbourne Institute of Technology

Sheffield Hallam University (UK)

The University of Melbourne

The University of Sydney

The University of Western Australia

University of Birmingham (UK)

University of Brighton (UK)

University of Newcastle (UK)

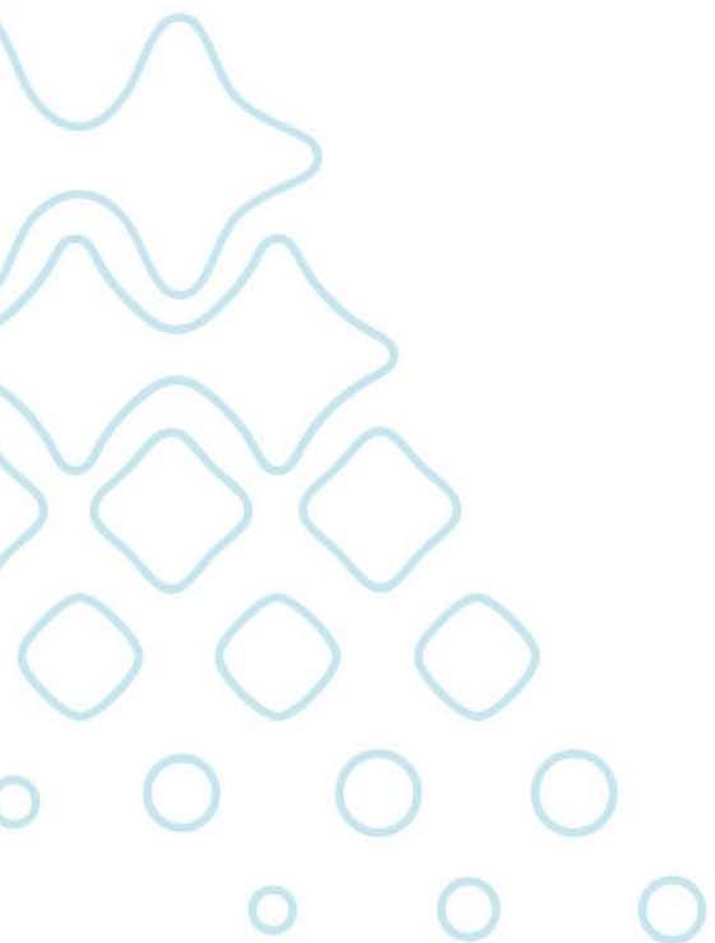
University of Portsmouth (UK)

University of South Australia

University of Technology, Sydney

Warwick University (UK)





**AUSTRALIAN
LEARNING
& TEACHING
COUNCIL**



Promoting excellence in higher education

PO Box 2375 Strawberry Hills NSW 2012 Australia
Telephone 02 8667 8500 Facsimile 02 8667 8515
www.altc.edu.au
ABN 30 109 826 628