

# 5.9 Lab 2.0

## What it is?

Lab 2.0 is an experimental learning space designed for students to be able to alter their physical environment to suit their learning needs. Students are encouraged to "make the space work for them" with new non-traditional forms of movable furniture and related technology. The space is enhanced with technology and collaboration software that enables

## Why it is?

In the area of virtual learning environments considerable thought and attention has been given to the concepts, tools and opportunities surrounding Web 2.0. The Lab 2.0 concept has been underpinned by the idea that we might apply the affordances that Web 2.0 culture provides within virtual spaces, to the design of physical

- Ensuring physical and technological flexibility
  - De-emphasizing fixed technology (Long Ehrmann 2005)
  - Creating spaces with a memory (Milne 2007)
  - Providing tools for (collaborative) remediation of digital content
  - Leveraging student technologies including mobile devices
- Ensuring that the space was zoned for sound and activity
- Ensuring that the space supported ongoing experimentation and evaluation that can guide ongoing institutional adoption. (O'Brien 2006)
- Ensuring that the outcomes established in the spaces could be cost effectively replicated elsewhere across QUT.

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students to share project work, documents and artefacts in real-time with other group members.

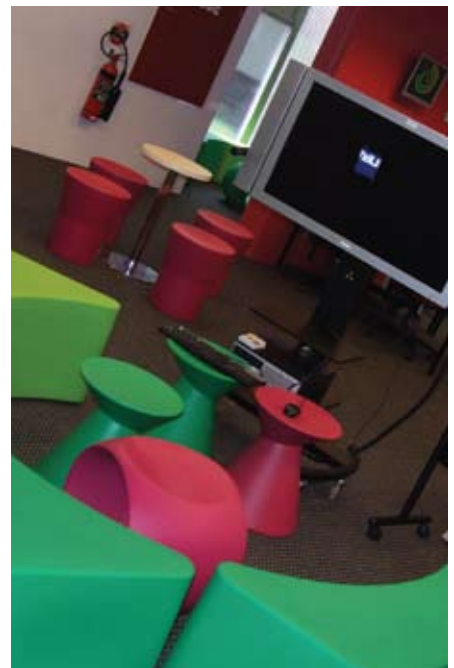
The Lab 2.0 space has been developed in a vacant space within the Library building on the Gardens Point campus. It sits adjacent to more formal computer labs and is seen as a complementary addition to the more structured University computing facilities. The space covers approximately 350 square metres and was redeveloped with a focus on flexibility, simplicity and reuse resulting in a total development cost of slightly less than \$90,000 including all furniture, technology, power and data fittings. Based on traditional figures for space redevelopment within the University, the space was redeveloped for between a third and a fifth of the normal costs associated with space redevelopment.

spaces. In mapping this virtual to physical cross-over, the design of the initial Lab 2.0 space was based on a number of objectives including:

- Moving from the perspective of a computer lab as an information access space to the lab as a participation/interaction space.
- Providing students with some sense of ownership and control of the space.
- Designing the space around architectures of participation.
- Installing fittings and technologies that allow the space to evolve rather than 'be designed'.

In seeking to achieve these objectives, the first Lab 2.0 space was established as an ongoing experiment to test next generation learning spaces design principles. The space was co-designed with students with a focus at the outset on meeting changing student learning needs rather than designing in response to a particular pedagogical specification. To meet the challenge of providing a space that could be used in a variety of ways there was an emphasis on:





**What happens here?**

The space is used in a variety of different ways depending on the time of the semester. At a broad level the space is used in the first and last parts of the semester as an individual reflective space, however during the middle of the semester (weeks 4 - 11) the design of the space facilitates group collaborative activities. During this time a range of different group related activities have been observed including:

- Real World Learning and Work Integrated Learning
- Peer Partnering and Peer Assessment
- Problem Based and Inquiry Based Learning
- Reflective, Creative and Critical thinking

Observation of activities within the space and data collected from survey results and wireless usage logs suggest that the predominant users of the space are undergraduate students doing science or engineering units. It is speculated that the space

supports their needs to manipulate text and graphics and utilise visual frameworks and models, as part of their assessment and problem solving activities.

A number of staff teams involved in various project related activities have been observed using the space suggesting that the utility or this type of space extends beyond student requirements to more broadly the support of group based activities. Staff adoption also suggests that attraction to the use of 'funky' and non-traditional furniture is not limited to younger students. It appears that the sheer functionality and flexibility of the space is the defining characteristic.

The common characteristic for all users appears to be their desire to use a range of technologies in an easily configurable group setting to share and jointly create documents, diagrams, and models and/or to access a range of technologies, tools and content in order to solve problems.

**How is the space used?**

In order to support a variety of uses and reflecting its experimental heritage, all the furniture in the space is both lightweight and easily portable allowing students to make the space their own. Furniture ranges from non-traditional recyclable furniture designed specifically to support dynamic group work, to more traditional ergonomic lab-based furniture. The sense of ownership and privacy is enhanced by the use of lightweight expandable paper walls that student use to create their own 'private' space.

**How is technology used?**

Like the furniture, the computers and plasma screens that form the basis of the technology provisioned into the space are designed to be mobile and flexible. All technology is situated on mobile trolleys that utilise umbilical cords to allow students to move them around, within certain parameters, to use them as they wish. The mobile

workstations allow individual use, facilitate connect to a student laptop and come installed with TeamSpot software to aid group collaboration.

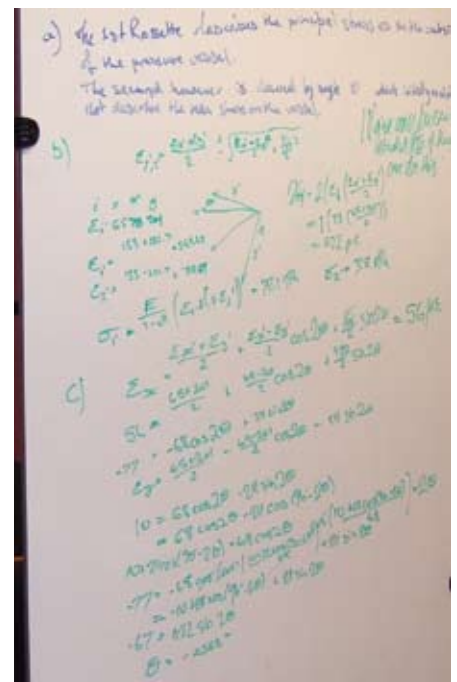
TeamSpot software (<http://www.tidebreak.com>) allows students to create virtual collaboration teams by connecting a number of their own laptops to a central plasma screen and then either share documents via the central screen, share documents with other laptops in the team and/ or co-create documents on the central screen. Unlike collaboration spaces that use small computer screens, the use of larger plasma screens means that a number of students can be meaningfully engaged together in real group work. This high-tech solution is matched with another popular low-tech element in the space: small mobile whiteboards. A typical configuration in the space is four to five students with a range of furniture types suiting both their own individual and group needs with a whiteboard and a mobile collaboration workstation.

### How was the facility evaluated?

The evaluation of the space has been based on a series of complementary and compounding evaluation methods allowing for both triangulation of key issues and analysis in depth of findings. The approaches used to date include:

- Student experience evaluation: facilitated by an ongoing space user's survey designed gather data about student attitudes to the space and its contribution to their learning experience. The survey contains both closed and open-ended questions designed to test students' views of the space; the elements they like or dislike; the ways in which they use the space; and the technology they use in the space. The survey also acts as a mechanism to elicit further design ideas that will be used in the evolution of the space over time. The survey remains open and to date there are over 100 responses.

- Technology utilisation and adoption evaluation: facilitated by analysis of system and wireless access logs to provide an overview of technology use and preference. One of the interesting elements of the analysis is the number of repeat users, those students who return again and again to use the space – an indication, in part, of the durability of the design to meet ongoing needs.
- Evaluation of the level of knowledge work undertaken in group collaboration sessions: facilitated by informal analysis of the nature of student content left on both the mobile collaboration workstations and whiteboards at the end of each day.



Two remaining forms of analysis are currently being implemented. They are:

- Space utilisation and adoption evaluation: facilitated by time-lapse recording of the way in which the space is configured and reconfigured by students. It is expected that this will help confirm and provide an understanding of how the use of the space changes across the academic semester.
- Learning outcomes evaluation: facilitated by student focus groups designed to unpack trends identified in each of the previous evaluation approaches and ratified by a broader range of evaluation instruments such as discipline specific mapping of the curriculum with the space as well as drawing upon the data generated by the above approaches. This approach will build upon the Flashlight methodology of evaluation. (Ehrmann, Milan and Group 1999)

### What were the main lessons learned?

While the Lab 2.0 experiment is ongoing there are a number of lessons that have been learnt to date. At the level of the space itself, the Lab 2.0 project has shown that:

- Space design needs to facilitate changing demands and building single purpose spaces (e.g purpose built group collaboration spaces) may not be an effective use of space for universities with limited space.
- Effective and meaningful group collaboration can be facilitated in a cost effective and relatively simple small-scale manner, implying that this type of model could be used in any spare space across a campus – including outdoors.
- Student learning preferences are hard to

predict but spaces designed around flexible fittings and technology allow students themselves to design and redesign spaces to suit their specific and changing needs.

- Mobility of items increases utilisation – mobile collaboration workstations are utilised at a rate of 2 to 1 over the same technology fixed to the walls of the space.
- The way furniture is used by many students is sometimes inconsistent with the intentions of spaces designers and furniture manufacturers – within the Lab 2.0 space tables are often used as seating surfaces and seating items are regularly re-purposed as layout or workspace.
- Risk management and innovation are not necessarily good companions – in the design and implementation of this experimental space there were a number of examples where new policy was needed and some central elements needed significant convincing to try things that were not necessarily consistent with previous practice.

At the level of the users of the space – students, a range of additional lessons have been identified including:

- Students both enjoy the use of the Lab 2.0 space and believe that it has a positive impact on their learning outcomes.
- The use of students as a co-design partner is both feasible and provides for highly interesting and useful outcomes.
- Higher order group thinking flourishes when the right blend of physical and virtual elements are brought together – analysis of content remnants suggests that either alone is insufficient.

### References

- Ehrmann, S.C., Milam, J., and Group, T. (1999). Flashlight Cost Analysis Handbook: Modelling Resource Use in Teaching and Learning with Technology: TLT Group.
- Long, P.D., and Ehrmann, S.C. "Future of the Learning Space: Breaking Out of the Box," *EDUCAUSE Review*, vol. 40, no. 4 (July/August 2005): 42–58.
- Milne, A.J., 2007, "Entering the Interaction Age: Implementing a Future Vision for Campus Learning Spaces", *EDUCAUSE Review*, vol. 42, no. 1 (January/February 2007): 12–31
- O'Brien, L.M., "Transitioning Academic Technologies from Experimentation to Institutional Support," presentation, *EDUCAUSE 2006 Annual Conference*, Dallas, Tex., October 10, 2006