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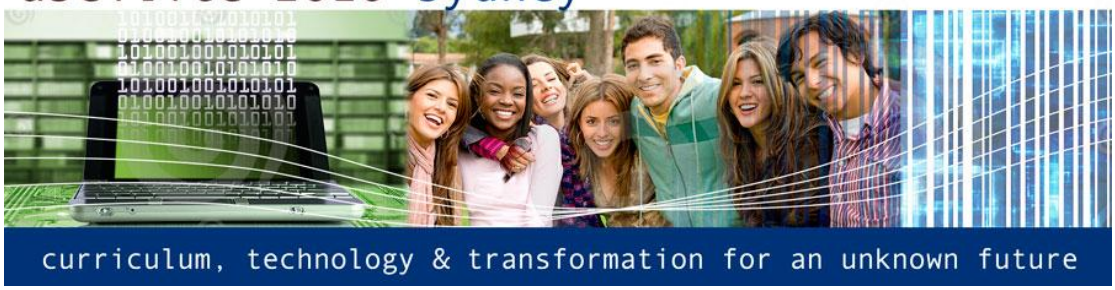

Implementing and evaluating a "Next Generation Learning Space": A pilot study

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A dramatic, pedagogical shift has occurred in recent years in educational environments in higher education, supported largely by the use of ubiquitous technologies. Increasingly, emphasis is being placed on the design of new learning spaces, often referred to as "Next Generation Learning Spaces" and their impact on pedagogy. The idea of "classroom" now incorporates the use of both physical and virtual space. This change has meant a greater focus on the design and use of flexible learning spaces, more use of blended learning approaches and more personalised, individualised learning opportunities for students. While many such classrooms have been built and utilised in universities globally, only a few formal studies have been reported on how these spaces are used by both teachers and students. This article focuses on a pilot study of the use by lecturers and students of a technology rich next generation learning space – the Pod Room – and makes recommendations for further research into the effectiveness of new learning spaces in universities.

Keywords: Learning spaces

Introduction

Bond University is a private, single campus university located on the Gold Coast in Australia. In 2007 the university revamped one of its traditional classrooms into a next generation learning space (NGLS) called the Pod Room, taking its name from the kidney-shaped, group work desks that are a feature of the room. This new learning space was designed by the second author to facilitate collaborative learning activities in a small-group based learning environment. The main features of the Pod Room built to accommodate up to 30 students include student "pods" (desks) capable of seating a maximum of six students with a networked computer and dual screens, a master pod (console) which is the facilitator's workspace, moveable furniture within the space and four whiteboards on the room's sidewalls. The construction of the Pod Room was part of a move in some universities across Australia to create new learning spaces spurred by the emphasis of the Australian Learning and Teaching Council (ALTC)'s funding of the Next Generation Learning Spaces Project in 2006 (Radcliffe, Wilson, Powell & Tibbetts, 2008). For reasons of space, a full description of the Pod Room is not included in this paper, but readers can refer to a previously published article (Wilson & Randall, 2009) available from the NGLS project website for these details.

This short paper presents a preliminary study and analysis of the Pod Room space. It is a pre-cursor to a larger work that will examine the interactions between pedagogy, space, and technology within the

context of a next generation learning space. In this paper learning spaces are defined as "those spaces which encompass the full range of places in which learning occurs, from real to virtual, from classroom to chat room" (Brown, 2005). The paper begins with a brief review of the emerging literature, followed by a description of the pilot study, data gathering and analysis methods used and discussion of the study's findings. The paper concludes with recommendations for future research.

Learning spaces literature

The scope of the literature relating to learning spaces is diverse and ranges on a continuum from general to more detailed in both conceptualisation and analysis. A range of perspectives are explored in this literature –pedagogy, architecture, space design, staff and student needs, and stakeholder involvement. There is a consistent view that universities must be more innovative and creative in the ways that they utilise, reconfigure and/or build new learning spaces in order to meet the expectations of tomorrow's students. There is broad agreement that learning spaces should be student-centred rather than teacher-centred; have the necessary technology and furnishings to meet student and "subject" needs; support a pedagogic, multidisciplinary, multimedia format that engages the student; and be flexible, ergonomically comfortable, functional, and multi-usable. Importantly, embedding technology into teaching and learning spaces must be "more of an evolutionary process than a revolutionary one" (Joint Information Systems Committee, 2006, p. 6).

Much of the learning spaces literature is focused on principles or guidelines for practice aimed mainly at telling the reader about the issues surrounding the design of learning spaces within an institution, or guiding the reader in anticipating what the future of learning spaces may hold. Oblinger's (2005) article on learning spaces is a case in point – a self-styled "primer" for institutional leaders, architects and space planners incorporating a range of issues connected to learning spaces: the need for an institutional vision; the types of analysis and information gathering an institution must do before beginning the design of the space; major design principles to be aware of in terms of their impact on such spaces; and the need for continual assessment of the impact of these spaces for continuous improvement of current and future spaces.

The research-focused literature on learning spaces has been boosted considerably as a result of the ALTC's Next Generation Learning Spaces (NGLS) project mentioned earlier. A key output of the NGLS project is a framework called the *Pedagogy-Space-Technology (PST) Design and Evaluation Framework* (Radcliffe 2009, pp.14-15) shown in Figure 1 by which new learning spaces can be both designed and evaluated. The PST framework is meant to be used by a range of users across a wide span of projects and institutions.

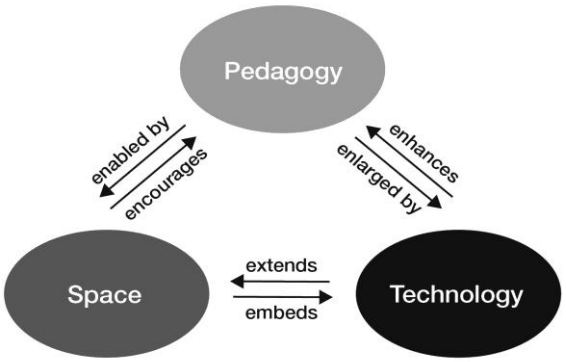

Figure 1: Pedagogy-space-technology framework (Radcliffe, 2009, p. 13)

Within the framework, the three areas of pedagogy, space and technology influence each other and key questions for evaluating learning spaces are framed within each of these three areas. Each of the Australian university case studies presented within the NGLS report have some form of institutional evaluation of a learning space described within the case. Results of evaluations across these cases have reinforced the benefits of a planned, collaborative approach to the design of learning spaces (Huon & Sharp, 2008), and the need for professional learning opportunities for teaching staff in the use of these spaces to gain optimal use of their features (Andrews & Powell, 2008). One study (Reushle, Kissell,

Fryer & King, 2008) emphasised the need for teachers to drive the space and the importance of having a formal project management process in place that continues beyond the launch and initial use of the space to manage scheduling, resources, maintenance and promotion of the concept of learning space.

Study description

The pilot study was conducted in 2008 across two teaching semesters. The focus of the study was to investigate the reactions of students and teachers from different disciplines to the use of the pod room and to identify areas of support for teachers necessary to optimise their use of this space. Seven academic staff comprised the sample for this pilot, four females and three males, selected from a list of lecturers who had expressed interest in participating in the pilot, and who also represented a spread of disciplines across the University: languages, sustainable development, teacher education, marketing, health sciences and information technology. Five of the seven in the pilot taught undergraduate students and two of the staff in teacher education taught postgraduate students only. Ethical clearance was gained from the University to conduct this research. An initial meeting was arranged with each academic to explain the nature of the pilot and obtain agreement to participate. All staff and student participants were required to read an information statement about the pilot and sign a consent form agreeing to participation in the study. Lecturers were given an initial briefing about the Pod Room design, the technologies provided within the space and a lesson in how to operate the master control panel.

A total of 56 students participated in the pilot by completing a survey consisting of six questions in class time about their experiences of the Pod Room at the end of the semester. The principal author observed one class in the Pod Room of each of the lecturers followed by a 30 minute interview about the teaching observation scheduled as close as possible to the observed class. Lecturers were asked on a weekly basis to record their ideas, thoughts and concerns as they used the Pod Room on a personal blog space created in a Blackboard™ community site created to support the pilot study. All seven academics made more than one posting to the blog, with three making multiple postings over the duration of the study. The authors had access to this blog space for the duration of the study. Information gained from analysis of the blog space comments and the interviews was used to support and amplify findings from the staff survey. This survey contained six questions and was emailed to lecturers at the end of the semester. Table 1 shows the questions asked of students and staff. The last question soliciting suggestions for changes to the Pod Room was the same for both groups.

Table 1: Student and staff survey questions

Student questions	Staff questions
How has the design of the pod room space impacted on the way you approaches your learning in this subject?	How has the use of the pod room impact on the way you teach this subject?
What differences you noticed about the way you used this space this past semester in this subject from the way you engage in small group activities in other small group teaching spaces?	What types of learning activities do you find this space has facilitated well?
Have you noticed any change in the way you interacted with your teacher in this space?	What have been the differences, if any, between the way you used this space and other spaces where you have taught this subject?
Have you noticed any change in the way you interacted with other students?	How has the use of this space impacted on your role as a teacher?
Has any aspect of the way you worked as a student in this room really stood out above all others? If so, please describe	What do you perceive as the impact this space has had on the student's experience of learning?
What would you add/change/remove from the pod room and why?	What would you add/change/remove from the pod room and why?

Analysis of the data was done initially by the principal author and further analysed by a research assistant employed for this purpose. Data from both sets of surveys were summarised for each question followed by a secondary level of analysis using the PST framework: pedagogy (types of learning and

teaching); space (aspects of space design and equipment); and technology (technologies which enhanced learning and teaching). Within each of these classifications data was further grouped into smaller, discrete areas and quotations from student and teacher data were selected as representative of key responses in each area. The results of this analysis are discussed in the next section.

Results and discussion

Data analysis showed that the two most effective *technologies* in the Pod Room were the master control panel at the front of the Pod Room and the computers at each of the student pods. Students and teachers strongly appreciated the ability of the master control panel to set students' monitors to the same content at the front of the room and also to feature group work from different pod groups by projecting group work on to one (or both) of the screens at the front of the room. While students acknowledged the team benefits of sharing one computer (and two screens) at a single pod, some also nominated the need to have more computers at each pod. A large number of students and all staff rated highly the affordance of the computers at each pod to enable easy student and staff access to Internet resources. Both teachers and students noted some occasional unreliability of the technology in the Pod Room which took valuable class time waiting for a technician to arrive to address the issue or prevented an early morning class from starting on time. Likewise, both groups acknowledged the need for instructions in the room on how to use the technology as well as additional "hands-on" training for staff and for all students who used the space.

One feature of the *physical space* that attracted a large number of negative responses from students and teachers was the computer monitors at each of the pods. To students they presented a physical and visual barrier between the pods as well as between themselves and their lecturers. Quite a few students commented negatively on the shape of the pod desks which they found locked them into their groups and prevented interaction with others in the room. In contrast, the flexible ottoman furniture at the front of the room was praised by both students and staff alike – students liked the interaction of the "huddle" at the front of the room, and several of the teachers found student participation in discussion increased when they moved students to more flexible seating arrangements at the front of the room. Most staff in the study expressed negative comments about the placement of the whiteboards on the sides of the room as they were hard to see by all the class – too far away for some of the pods and too close for others. One lecturer suggested a moveable whiteboard on wheels to address this issue. None of the academics in the study mentioned the benefits of using the document camera located on the master console at the front of the room. Overall, academics praised the flexibility of the learning space that enabled easy movement from desk-based activities to discussion-based activities without have to re-arrange furniture as would occur in a more traditional tutorial space. Students echoed this sentiment in their praise of the Pod Room as a space where it is easier to relax and learn.

Focusing on aspects of *pedagogy* in this study, students reacted positively to the student-student interaction afforded by the Pod Room. Many found themselves more engaged in their learning. Teachers and students both found group work more enjoyable in this space than in a more traditional classroom. Several students mentioned the benefit of learning in the space in terms of teacher-student interaction, commenting that it was easier to work interactively, and the relationship between teacher and students improved due to the increased communication and interaction between them. Most lecturers professed a change in their role as teachers in this space – one academic stated "I teach a lot less in the Pod Room"; another felt herself more "student-centred"; while another found that he could "use activities that allow me to step back and encourage independent learning and peer support more effectively". The study also revealed differences in the way the lecturers used this space that seemed to be driven by their discipline and the subject that was being taught rather than by the individuals themselves.

Conclusion

The Pod Room space was an institutional response to the challenge of building a next generation learning space designed to foster collaborative and small group learning and facilitate the use of new technologies across the disciplines. The data arising from this pilot study demonstrated the learning benefits achievable by the use of a next generation learning space like the Pod Room, but also pointed to the need for changes to some areas related to technology and physical space in the design of future learning spaces at the University. Importantly, this study yielded a number of areas spanning all three dimensions of the PST framework that warrant more specific attention – areas of learner interactivity, learner engagement, teacher and student use of specific technologies within the space, and discipline-

specific approaches to use of this space all merit further investigation. Also evident in this study was a need for exploration of the nature and type of professional learning for staff working in new learning spaces, as well as an optimum way of delivering such support. Further research is planned by the authors.

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