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Traditional knowledge systems and real time learning spaces

More than playgrounds

Improving the (not so) new landscape of teaching and learning

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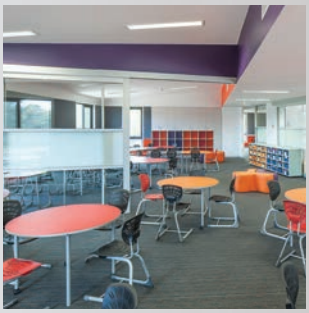

Designing learning spaces

There is some debate over the influence that different learning environments, including physical spaces, can have upon how teachers work, teacher effectiveness and student learning. Some point to the traditional classroom as some form of 19th century, or even earlier artefact. Others might say that the traditionally-designed and operated classroom has and continues to serve us well. Similar arguments, both for and against, can be used in respect of specialist buildings such as laboratories, libraries, creative arts spaces and sporting facilities. Some have even argued we will not need schools at all—at least in the physical sense—in the future, with the development of 'cyber' learning and with teachers and parents acting as learning coaches. Students will be left, literally and figuratively, to their own devices.

There is another area of debate concerning issues such as school size, socio-economic status and resourcing. Put simply, some schools have much more expensive and expansive facilities than others. Other less well-endowed schools are in dire need of basic maintenance. What then is the relationship between different learning environments and student outcomes? Another important question is around the need, or not, for teachers to change their pedagogy to make the most of different settings and designs for learning, including breaking down the traditional isolation of the teacher within classrooms.

In recent times we have seen significant spending on school buildings through the Building the Educational Revolution (BER) economic stimulus program whereby over $16 billion was spent on providing schools with new and refurbished classrooms, halls, libraries, science and language centres and other facilities. Many schools that could not have hoped for such new facilities gratefully received this unexpected blessing but a key question remains of whether any improvements in student learning, personal and social development have flowed from these.

Various commercial interests are citing 'large' and even 'huge' influences on student learning for things such as colour, lighting, noise, air quality, classroom design and furniture. As well as the marketing spiel of these companies, there has also been more rigorous research , some of which purports to show 'boosts' in student learning—however defined and measured—of 15 per cent, 25 per cent, or even 50 per cent over the course of a year. A key question here is that of attribution and in particular, the contribution the teacher and the quality of their teaching makes to such claimed increases in learning. If these things do matter, what then are the implications for how we prepare and professionally develop teachers and school leaders, how they work together and how we resource and staff our schools? Further, are some designs and approaches more effective than others and if so, are these effects uniform across ages, stages and contexts? Are there really 'quick fixes'? Do these things really matter, or does it still come back to the teacher? Hattie (2009), for example, found only a tiny difference (d= 0.01) between 'open' and 'traditional classrooms' in respect of the influence of each on student learning, with the teacher as the biggest in-school influence on student achievement.

It is timely then to explore the issue of the potential contribution of school and classroom design to teaching and learning. This *Professional Educator* brings together a variety of papers, perspectives and projects to explore some of the important questions above, as we continue our quest as educators to see every student experience academic success and personal and social development and to raise achievement overall and to close gaps associated with disadvantage.

Professor Stephen Dinham OAM, FACE
ACE National President

Improving the (not so) new landscape of teaching and learning

BENJAMIN CLEVELAND AND WESLEY IMMS

Do the spaces where teaching and learning take place matter? Does architecture influence educational practice? Through a brief appraisal of current developments in education (via a spatial lens) these and related questions can be addressed. This article will look at the contemporary architectural design of schools and interrogate some of the emerging issues surrounding the programs of spatial transformation that can currently be seen in schools across Australia and New Zealand. In particular, the drivers behind the designs of new educational facilities and relating these to historical precedents of innovation in school design will also be discussed.

What are commonly termed 'New Generation Learning Environments' (NGLEs) can be loosely defined as learning spaces that provide a greater degree of spatial variation, geographic freedom and access to resources for students and teachers than traditional classrooms. A variety of spaces tend to be grouped under this umbrella. In the primary and secondary school sector, these include at least five distinguishable building typologies (Dovey & Fisher, 2014) that range from classrooms that have been updated with contemporary furniture and digital technologies, to transformable spaces that can be opened-up or closed-down through the use of sliding panels, to large open spaces that commonly feature interior elements that help situate diverse teaching and learning activities.

What makes these spaces 'new generation' may in some instances relate more to the educational value and belief systems that have driven their design (and intended patterns of use) than to their physical attributes. Nevertheless, design features that promote transparency, connectivity, interactivity and collaboration are common. Respectively, these features may be achieved through the extensive use of glass, the selection of work surfaces and seating options that promote small group activities, and the integration of new technologies that promote shared inquiry, problem-solving and discussion.

New generation learning environments – useful, but not a silver bullet

Since 2009, the Learning Environments Applied Research Network (LEaRN) at the University of Melbourne has been conducting research into the relationships between pedagogy and space. Informed by both educators and designers, much of this interdisciplinary research has focussed on the development and use of NGLEs in the primary, secondary and tertiary education sectors.

LEaRN's past research and current thinking on the connections between teaching and learning and architecture

LEaRN's belief is that NGLEs are a much needed innovation in Australian and New Zealand education. However, not all NGLEs are equal and such innovation should not be mistaken as a stand-alone intervention that will significantly impact educational practice. When well designed, NGLEs of various typologies can provide a range of useful affordances to support pedagogies based on notions of social constructivism and student engagement. However, Lean's research over the past half-decade has shown that for spatial innovation to have any significant impact on pedagogy it must be backed by well-conceived and well-delivered social programs, for example professional learning and wider community communication initiatives. While new spaces may afford new opportunities for teaching and learning, that is not to say that new spaces will lead teachers and students to change their habitual practices and quickly adopt new pedagogies without support.

Space as a key component of the educational mosaic

A review of the history of school design reveals the integral role that space has played in the development of educational practice over time. From the one-room school houses of the early 1800s, to the common schools of the mid 1800s and early 1900s, to the open plan schools of the 1960s and 1970s, school design has embodied and expressed the educational values and beliefs of the times (Tanner & Lackney, 2006). Since the advent of formal education, architecture has been employed as a lever to advance pedagogical practice and update education systems around the world. For example, Tanner and Lackney (2006, p. 6) suggested that 'the factory model school layout [of the mid 1800s in the United States] was a direct response to the needs of the common school education system that required repetition and uniformity'. As suggested by Monahan (2005), school architecture has long embodied the accepted educational philosophies and practices of the period, as 'built pedagogy'.

Prior to the current movement towards the creation of NGLEs in schools across many developed nations (OECD, 2013); the most recent well-recognised shift in educational thinking and school design was the open education and open plan schools movement of the 1960s and 1970s. During this time educators and architects engaged in a process of rethinking how schools should be socially organised and spatially configured. The educational philosophies of prominent figures such as John Dewey and Paolo Friere informed this wave of innovation, as academics and educators pursued pedagogies and spaces which could support experiential and democratic education, along with new forms of social interaction between teachers and students. This period followed nearly two centuries during which the factory production-line metaphor had informed the design of school curricula, pedagogies and assessment practices, and the design of school buildings (Cleveland, 2011).

The Educational Facilities Laboratories in the US is widely credited with popularising the concept of the open plan school. Typically, these facilities were designed to be simple, open, and flexible and to cater for large cohorts of students and team teaching approaches (Gross & Murphy, 1968). They commonly featured a variety of activity settings, including general learning spaces, withdrawal spaces, wet areas, quiet areas and covered outside spaces. New furniture designs, including mobile dividers, acoustic screens, chalkboards and tables were also introduced to facilitate flexible social arrangements (Rodwell, 1998).

In Australia, the concept of open plan design was interpreted differently in different states and territories:

In South Australia open plan primary schools were notable for their very large open spaces, often equivalent in size to eight traditional classrooms. These spaces frequently had no partitioning between teaching areas and presented users with limited opportunities for visual or acoustic separation. In Queensland, New South Wales and Victoria, smaller spatial units were normal. In these states, open plan schools were often comprised of spaces of a size comparable to two conventional classrooms. In Tasmania, the Australian Capital Territory and the Northern Territory a variety of spatial configurations were constructed, while in Western Australia open plan school models were characterised by clustered spaces equivalent in size to six traditional classrooms. The Western Australia models could be divided into smaller spaces by drawing partitions into three pairs or six individual units (Angus, Evans & Parkin, 1975) (Cleveland, 2011, p. 57).

The open plan schools movement is generally considered a failure. Why? The reasons given in the literature commonly point towards a disjunction between practice and space. In Australia, it was reported that some teachers found it difficult to adopt new pedagogies in open plan spaces and became confused in their educational roles (Rodwell, 1998). Such confusion was often attributed to teachers not being supported in the transition into new spaces. Indeed, Beck (1980) concluded that open plan schools may have been more successful had teachers been given more guidance as to what was expected of them in these environments.

Creating and closing the gap between educational practice and spatial innovation

The concepts that drove school design in the 1960s and 1970s were remarkably similar to those which are informing school design today. Driven by education and social reforms, the development of open plan schools was a significant attempt to change the physical nature of schooling for the purpose of supporting emerging pedagogical practices and improving the overall experience of schooling.

If we assume that educational system improvement has followed a steady upward trend since the advent of mass formal schooling, the following conceptual diagram (Figure 1) might represent the relationship between such improvement and school design innovation. As education systems have tried to support advancements in teaching and learning practices through the design and construction of 'new spaces', gaps between incumbent practices and those intended by facility designs have emerged. It could be said that school design has 'leapfrogged' widespread educational practice on a number of occasions over the past two hundred years. Yet, the 'gaps' produced during these periods of design innovation have historically been closed as teachers and learners have adapted to new 'educational landscapes' and re-aligned pedagogy and space – perhaps with the exception of the open plan movement of the 1960s and 1970s.

Today, it could be argued that leading educational practice has overtaken the affordances of traditional classrooms, and that these spaces no longer provide an environment supportive of contemporary pedagogies. In many ways we may be revisiting the open plan schools movement, but on this occasion the desire for more agile, adaptable and multi-modal spaces has been directed more by educators wishing to engage students in learning activities that are already being practiced yet not adequately supported by historically derived environments.

The rhetoric around contemporary education tends to focus on pedagogical concepts such as, 'learner-centred', 'personalised', 'enquiry-based', 'technology-enabled' and 'collaborative'. While all of these ideals can be explored in traditional classrooms, we would ask, 'but to what extent'?

The education systems in Australia and New Zealand have advanced past the point where traditional classrooms are adequately supporting desired teaching and learning practices, and the current programs of school spatial transformation are a response to emerging practices having been constrained by 'old' spaces. Nevertheless, gaps between practice and space exist at many schools that have been (re) designed as NGLEs. At these schools teachers are entangled in the process of developing the pedagogies and spatial literacy required to take full advantage of contemporary learning environments.

Following almost ten years of significant spatial development in school systems, such in the state of Victoria, fears of continued disjunctions between practice and space, as witnessed during the 1960s and 1970s, may be abating as more and more schools continue to emerge that have made significant advances in their pedagogical approaches and allied use of space. At these schools, the gap between practice and space has been closed, revealing to us the future of schooling and providing exemplars to follow.

At the Design Speaks: Old School / New School forum held at the Museum of Sydney in October 2014, Julia Atkin suggested that we are currently in the uncomfortable phase of transitioning between the spaces and practices of yesteryear and the spaces and practices of tomorrow. Uncomfortable because while some practices are constrained by 'old' spaces, other practices are still well-aligned; and while some practices are a better fit in 'new' spaces, others have yet to adapt.

So, where to from here? While the field of learning environments research is growing, it is by no means mature. Further research is needed to aid the development of effective NGLEs. Evaluation studies, such as those currently being conducted by LEaRN at the University of Melbourne, hope to go some way to addressing these issues. The Evaluating 21st Century Learning Environments (E21LE) ARC Linkage project and Towards Effective Learning Environments in Catholic Schools: An Evidence Based Approach project sponsored by the Catholic Education Office Melbourne, both aim to develop new approaches to learning environment evaluation and evaluation tools that can be used to develop an evidence base to inform both the design and the pedagogical use of learning environments. Furthermore, another recently awarded ARC Linkage project, Innovative Learning Environments and

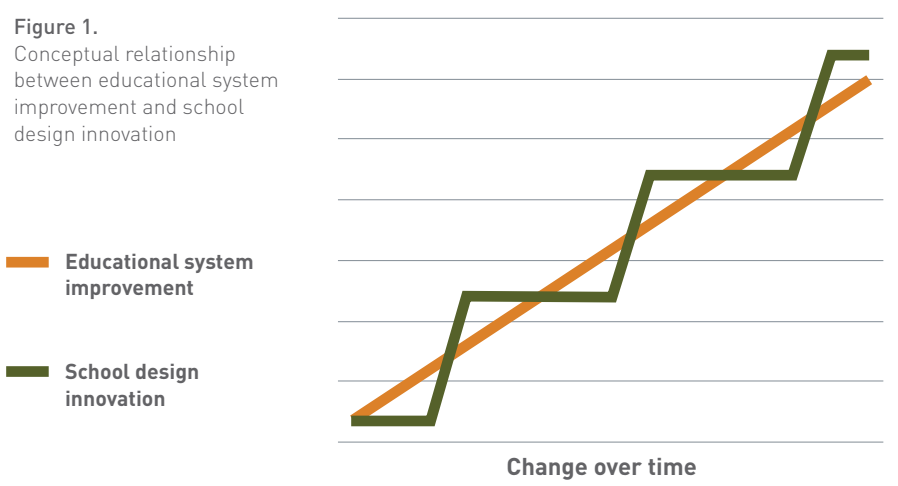

Figure 1.
Conceptual relationship between educational system improvement and school design innovation

Teacher Change (ILE&TC), will assess the influence of NGLEs on the mindsets and professional practices of teachers. Watch this space!

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Photos courtesy of Dianne Snape.

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Visit www.learnetwork.edu.au and www.e21le.com for more information about LEaRN research.

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Developing readiness for change

MARK OSBORNE

The regeneration of schools and infrastructure

Following the 2011 earthquakes in Christchurch, the New Zealand government embarked on an ambitious plan to regenerate 115 schools with an overall investment of NZ$1.1 billion. The Greater Christchurch Renewal program provided the opportunity to rebuild the schools not as they were, but as 'modern learning environments', featuring more open, flexible and interconnected learning spaces. With this opportunity has come challenges; principally that of transitioning the teaching workforce from industrial-era classrooms into more agile and adaptable spaces for collaborative teaching and learning.

With the renewal programme likely to stretch across more than six years, many school and sector leaders are preparing their teachers, students and communities for significant change in the way education is enacted/delivered. The regeneration of the Christchurch school network is a classic example of disruptive, transformative change. Given that two thirds of transformative change fails (Vakola 2013), it seems that the odds are stacked against the sector making a smooth transition to collaborative teaching and learning practices. So what can leaders do to grow individual and organisational readiness for change and achieve the desired outcomes?

Ready for change?

Readiness for change was defined by Armenakis, Harris and Mossholder (1993 p681–682) as 'the cognitive precursor to the behaviour of either resistance to, or support for, a change effort'. In other words, it is the lead-up that counts with respect to a person deciding whether they are going to support a change or resist it. There is reasonable consensus in the literature that three things increase a person's readiness for change; and therefore the likelihood they will commit to a change. These include:

1. A belief that change is needed
2. A belief that the proposed change is appropriate for the challenge at hand
3. A belief that the organisation has the capacity to implement the change.

Each of these conditions is explored in more detail below.

Is change needed?

The first condition, 'a belief that change is needed', centres on establishing a 'why' for change (also called 'a sense of urgency'). This often involves leaders seeking data and other forms of evidence that highlight discrepancies between the current situation (reality) and the desired future state (vision). For example, if an organisation wants to achieve a vision of every students being able to follow their passions, a leader might examine the socio-spatial learning environment in a way that helps staff to question whether every student is actually able to achieve this. If they cannot say this is true for all students, then the group might agree that change is needed.

The articulation of a clear, shared, aspirational vision statement is central to the process of comparing current realities with desired futures. Good schools often build success around inspiring vision statements, like 'every child; every opportunity', but great learning organisations relentlessly work towards achieving new successes by exploring the discrepancies between what they say they do and what they actual do.

This discrepancy, or dissonance, can be uncomfortable; due to our awareness that what we say we do does not always translate into what we actually do. Cognitive dissonance theory tells us that people often seek to resolve dissonance in two ways: (1) they change their beliefs, and (2) they change their behaviours (Festinger 1957). Referring to the example given above, to change the beliefs of a school community would require a school to adjust its vision statement to something like 'every opportunity, but only for some', which would be unacceptable to most people. This leaves the second strategy for resolving ►

dissonance: changing behaviour. This is where momentum for change can come from.

Organisations can also develop awareness that change is needed by exploring what will be lost if they continue with current ways of doing things. Leaders wishing to explore such issues often ask things like: 'If we're still doing what we're currently doing in five years' time, what opportunities will we have missed out on?' Essentially they are asking, 'What is the opportunity cost of maintaining the status quo?'

With respect to new learning environments and new pedagogies, practical examples of how schools can build change readiness by analysing the risks associated with the status quo include:

1. Convening discussions about the 'cost' of retaining industrial-era classrooms in a world where multi-modal learning and teacher collaboration are increasingly important.
2. Exploring the limitations on student creativity and problem-solving associated with horizontal (within year-level) vs. vertical (between-year-level) social groupings and the impacts of both forms of social organisation on collaboration.

Building consensus that change is needed can contribute to a sense that the change is legitimate and not simply the current whim of leadership, or this month's passing fad. Such work is critical if people are to commit to change (Holt et al. 2007).

Is the proposed change appropriate for the challenge at hand?

Once there is some consensus that change is needed, the next condition that needs to be satisfied for change to be achieved is for people to believe that the proposed change is appropriate for the challenge at hand. There are two key elements here: (1) the level of fit with the organisation, and (2) the likelihood that 'this' change is right for 'this' challenge. Imagine the widespread frustration in an organisation that knows it must change but has no idea how to go about it.

The level of cultural fit, or congruence between a change initiative and an organisation's vision, is important because trying to adopt a change initiative that runs counter to an organisation's culture seldom finds success, even in cases where the same change has been successful in a similar setting. For instance, if a proposed change centres on empowering leaders to make quick, unilateral decisions, but an organisation has a strong culture of participatory decision-making, the change would be viewed as being of 'low-cultural fit' and not appropriate within the culture of that particular organisation.

Leaders can also increase peoples' sense that a given change is appropriate by making transparent the decision making process. By making visible the pros and

cons that guided the choice of a given change others can see the reasoning at work.

Can we successfully implement this change?

A belief that the organisation has the capability and capacity to successfully implement the proposed change is the third component of change readiness. Imagine an organisation that knows change is needed, believes that the proposed change is the right one, but is so disillusioned by prior attempts at change that they remain cynical that any attempts at change are going to fail. But fear not, there are a number of things that leaders can do to increase an organisation's sense of self-efficacy when it comes to implementing change. These include:

- Ensuring that every change is well-considered, thoroughly researched and carefully implemented.
- Providing timely and adequate information about the change, including keeping staff, students and community informed about 'big picture' considerations and 'small picture' details. This might include using websites, public meetings, focus groups, social media and printed communication.
- Establishing participatory decision-making processes that involve participants in problem-finding as well as the problem-solving.
- Prototyping wherever possible, especially with respect to new learning environments, where change readiness can be promoted by prototyping new spatial settings/ arrangements and associated curriculum design, pedagogies, and assessment practices.

Implications

The key challenge associated with building change readiness is that it is difficult to achieve quickly, especially if an organisation doesn't have a sense of urgency about change. Similarly, if individuals are disillusioned about the failure of previous change initiatives, it takes time for their self-confidence to return. A clear implication for leaders of change is that readiness for change needs be developed well before change is needed. Paradoxically, by the time change is upon you, it may already be too late.

Research suggests that despite the level of organisational change readiness, it is the level of change readiness of individuals that will determine the success or failure of a change program (Vakola 2013). Further, individuals' attitudes towards change are shaped by group membership, so the attitudes of key team members toward change can influence those around them (Vakola 2013).

Schools can maximise the likelihood that staff, students and community members will support changes to physical learning environments and associated practices by:

1. Clearly articulating the educational objectives they hope to achieve through redesigning their learning spaces, for example, raising achievement levels, increasing higher-order thinking skills and fostering innovation. Such communication should be ongoing and use a range of different communication strategies, including face-to-face meetings and social media.
2. Helping staff, students and other members of the school community understand the research that sits behind collaborative teaching and the affordances of innovative learning spaces. For messages to be believable, they should be based on sound research, but also be presented in an approachable way.
3. Building a sense of self-efficacy around change by celebrating the successes achieved through smaller changes. Showcasing such gains made due to the actions of teachers and other staff can contribute to an increased sense of self-efficacy around change. In the context of learning spaces, this might include inviting team members to share changes made to the selection, configuration and use of furniture, or the sharing of resources to support co-teaching and collaborative practice.

Given the many challenges associated with renewing the school network in Christchurch, school leaders can shift the odds in favour of successfully regenerating schools and school infrastructure by implementing some of or all of the strategies outlined above. In particular, it is important that school communities believe that (1) change is needed, (2) the proposed change is appropriate for the challenge at hand, and (3) that the school has the ability to successfully implement the change. While these three strategies will not guarantee success, they will certainly shift the odds in favour of it.

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Photo courtesy of Mark Osborne.

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The role of open learning environments

SUSAN HYDE, MACE

Recognising the supposed 'failures' of open school design in the 1970s (Beck, 1980; Rodwell, 1998) and exploring the potential of 'open' learning environments will assist us in thinking differently about the way education is enacted today. In particular, exploring the influence of space on (1) the ways teachers and students can work together to create democratic settings for learning and teaching, (2) opportunities for interdisciplinary curricula to be developed, and (3) the creation of collaborative learning experiences for students and teachers alike.

In 2015, 20th century industrial structures and hierarchical power relations still dominate our secondary schools; one class, one year level, one disciplinary subject, one classroom at a time. This situation is creating a crisis in secondary schools, with many young people becoming disengaged due to a lack of opportunity to live and learn in a democratic setting.

Does it have to be that way?

Thankfully, the past decade has seen some inroads into the development of more contemporary and democratic socio-spatial settings for learning and teaching. The creation of secondary schools including Gungahlin College in Canberra, Albany Senior High School in Auckland, and John Monash Science School in Melbourne, has challenged our thinking about how secondary schools can operate and how they should be designed. Leading this developmental process in the Australian context has been the Australian Science and Mathematics School (ASMS) in Adelaide, established on the grounds of Flinders University in 2003.

The ASMS, a non-selective senior secondary school (Years 10-12) that specialises in interdisciplinary inquiry-based learning in science and mathematics, operates in a purpose built facility that features an open and technology rich learning environment (OECD, 2012). Funded by State Government, this public school has a charter to transform science and mathematics education. As such, it includes a professional learning service that supports educators in South Australia and around the world to envisage 21st century curricula and pedagogies.

The group who conceived the school in the late 1990s were concerned that young people were turning away from the study of Science and Mathematics, a trend that has regrettably continued across the sector. The founders designed the school, both physically and conceptually, to host a different way to design curriculum and enact learning and teaching. Some important features of the school that continue to embody their ideals include:

- Open, flexible learning spaces that are enriched by 24/7 access to information and communication technologies (ICT)
- Interdisciplinary, inquiry-based curricula designed to help learners connect concepts and contexts
- Large groups of Year 10 and 11 students taught by teams of teachers with different disciplinary backgrounds
- Teaching and Learning Teams' that design, teach and assess the curriculum and student performance
- Shared teacher offices that are open to learning spaces, thus enabling interaction and communication
- A strong focus on the development of self-directed learners.

Democratising teaching and learning relationships

When reflecting on a decade of practice at the ASMS, it is clear that teachers have worked together in very different ways from their counterparts at most other

secondary schools. The quality of the teamwork generated is perhaps the most prominent difference. For over 10 years, teams of teachers representing different disciplines have worked together to design, assess and accredit the inquiry-based interdisciplinary curriculum. This program, called Central Studies, incorporates the traditional science disciplines along with Mathematics, English and various humanities disciplines. The program has evolved over time, inspired by the scientific progress and development in areas such as Bio-science, Nanotechnology and Communication Systems.

The quest to develop self-directed learners has involved working with students to help them discover their strengths, seek feedback at every opportunity, and identify areas in which they could improve. Teaching and Learning Teams have developed pedagogical practices to support this development of self-directed learners.

To help students focus on their capabilities, a shift from 'teaching as telling' to 'teaching as intervention and feedback' remains a strong focus.

The influence of the physical environment has been profound. In the learning commons up to 120 Year 10 and 11 students learn amongst each other in the flexible ICT enabled spaces, supported by teams of up to four teachers. Students choose their own device, where they sit, who they sit with, and which workshops they attend. These socio-spatial arrangements create new norms and power relationships. The students create their own learning spaces, usually in groups, sometimes as individuals. This encourages teachers to move amongst the students, intervening where required, providing assistance, discussing ideas and provoking deeper thinking. The open learning environment creates accountability for students: they are responsible. The following quote, from a Year 10 student provides some insight into the student perspective:

The open space has changed my learning and the way I learn completely. Staying away from the teachers has helped me improve my learning by talking to my peers and exchanging ideas. Whereas at my other school I was stuck in a single room being taught by a teacher giving us instructions so I couldn't use my thinking. Here, I use my creativeness as a first preference, and if I need help only then do I go to teachers (Ashu, Year 10 student).

Democratising leadership relationships

The way teachers understand the notion of leadership no doubt influences their thinking about power relations and leadership structures.

Upon testing some of Harris' (2009) ideas about distributed leadership, it became obvious that teachers still saw themselves operating within a system of traditional hierarchies – even when recognising the high levels of productive teamwork occurring at the school. This was perhaps not surprising, as embedded in the term 'distributed leadership' is the idea that someone is distributing the power.

More appealing were Headley Beare's (2006) ideas about moving away from the school as a machine-like organisation, to a 21st century 'imaginary' that envisages the school as a living system: a network of relationships, rather than lines of authority and power.

The Contributive Leadership Model (see www.asms.sa.edu.au/wp-content/uploads/2012/10/ASMS-innovation-AARE-dec12.pdf) was first conceived by the school in 2012 and was recently updated. Through contributive leadership, the ASMS is currently seeking to further realise its charter, that is, to transform Science and Mathematics education. The ideas generated through collegial teamwork are intended to flow throughout the organisation and on beyond the school. Guided by this model, teams are formed based on the work that needs to be done and the learning that is required to design new curricula and embed new pedagogies. In this model, leadership arises from the expertise and knowledge of individuals and groups, rather than from the roles or positions that people fill.

The importance of the open learning environment as an enabler of this 'organic system' cannot be overstated. The architecture of the ASMS has been central to the success of the learning and teaching model, through the forms of social interaction that it supports. The informal meeting of people, consistent communication, and the general awareness of what others do, has been made possible through the design of the school. Teachers are not locked away in an office and everyone's practice is available for others to see.

The combination of educational and organisational philosophy and space can provide a socio-spatial setting that is concurrently dynamic, flexible and democratic. This combination has evolved to support people to work and learn together and provide a reference point for thinking about the future of secondary school education more widely. The effectiveness of this socio-spatial combination can assist in realising many objectives that drove the open school movement of the 1970s, but which were not widely realised at that time.

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Photo courtesy of Susan Hyde.

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Structures for the productive inhabitation of shared learning spaces

CHRIS BRADBEER

Teacher collaboration has long been viewed as a powerful component of educational change. Today, the development of effective teacher teams is increasingly being viewed as an important element in addressing educational problems relating to quality of teaching, school improvement and student learning outcomes (European Commission 2013; Hargreaves & Fullan 2012; Hattie 2012). In today's networked world, collaboration is viewed globally as a growing imperative, as well as a valuable dispositional characteristic for students to learn at school. To develop students' collaborative capacities, Coke (2005) suggested that as teachers we need to 'practice what we preach' and model effective collaboration within school settings.

A roll-call of primary school settings will quickly reveal that the spaces that many of us teach in are less than conducive to collaboration and working closely with colleagues. Schools remain predominantly 'single-celled' environments that privilege 'invisibility', 'privacy', 'autonomy' and 'territory', not qualities conducive to collaboration. That is not to say that teacher collaboration does not occur. Professional Learning Communities (DuFour & Eaker, 1998), data teams and year level teams commonly form the structures that guide professional practice in schools. Yet, collaboration remains a largely 'visited' activity; something that takes place outside the walls of the classroom environment and away from the interface with students.

Spatial innovation

The current development of 'new generation learning environments' in schools may offer the affordances required for teachers to work more closely together. Designs that deliberately group sets of teachers and students together not only provide opportunity to realign the 'built pedagogy' (Monahan 2002) of learning spaces with contemporary models of teaching, learning and curricula, but signal a spatial intentionality for teacher collaboration.

Often these new environments are purposely designed for groups of two, three, four or more teachers to work together with a large cohort of students. Such spatial arrangements offer the potential for (1) teachers to collaboratively plan, work together and share professional development, (2) team-teaching approaches to be developed that can offer pedagogical alternatives, and (3) teams of teachers to work together to better meet the needs of students, including providing students with more personalised attention than when taught by a single teacher (OECD 2013).

The reality of 'shared space' brings with it multiple questions: What does teaching together look like? What team-teaching models work and should be adopted? How are new spatial opportunities being realised by teachers, and to what effect? What are the implications for teacher practice with respect to the work they do together/alone? How should teachers approach working in new ways? How do new environments and collaborative practices impact teacher identity? And ultimately, what are the pedagogies and practice routines that emerge from new spatial affordances and the implicit reorganisation of teachers and students into larger groups?

Teacher collaboration

A school principal I interviewed recently remarked, 'I'm constantly amazed at how much structure and organisation you need to be truly flexible'. This statement reflects the position that many teachers find themselves in when transitioning into shared spaces, and reveals a critical tension: some structures are required for the productive inhabitation of new learning environments, but too much structure may make the flexible inflexible.

What are some deliberate approaches that schools have taken? Below are a few emerging trends:

1. Being clear about the 'why':
Discussion about 'why are we doing this' should precede any development of new systems and structures. Schools often report getting bogged down in the detail of 'what it will look like at nine o'clock on a Monday morning' before identifying the specific values and beliefs that underpin 'why they do what they do'. As Atkin (1996) argued, discussing the 'why' is an important step in organisational change. Such discussion provides a powerful platform from which to make subsequent decisions about 'what' and 'how'.

2. Co-constructing a set of norms and expectations: For a team, having a collective understanding of shared expectations can help to ensure clarity and provide accountability. What time are we going to meet? What will we do during that part of the day? Who does what, when, and how? What happens if we don't do what we said we'd do? Some teams have created shared agreements as they begin working together, while others have created a shared language around collaboration.

3. Determining what is to be done collaboratively: Gray (1989 p. 5) defined collaboration as, 'a process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible'. This reflects the belief that when two or more participants come together they can often achieve something that they could not accomplish on their own. As such, collaboration is a step beyond cooperation, where participants dissect a task and combine their work into the final outcomes. Collaboration takes time and effort. Identifying what work teachers are going to do together and what they will do alone is a useful step.

4. Maximising opportunities afforded by multiple teachers: Just because three teachers are working together does not mean that a group of students has to be divided evenly three ways. One of the prime opportunities afforded by a shift into shared spaces is the opportunity to redefine the 'class'. Exploring team-teaching and synchronous practice ►

►

options and asking questions such as, how might one teacher work with a targeted group of learners to increase 'dose and density' of learning? Or, how might two teachers engage with students working in various sized groups – could one act as 'roamer' with a specific role to 'notice, recognise and respond'?

5. Creating online environments that help us work smarter not harder: Collective ownership of a large cohort of students means that teachers must be able to access and contribute to curriculum and assessment documentation and communication with team-members and parents. Effective online spaces enable teachers to aggregate data, share learning design and planning, and mechanisms by which to flexibly group students around specific learning goals. To create 'collaborative efficiencies', many schools are exploring Google docs and other proprietary digital tools, or are designing platforms to help achieve this.

6. Developing teacher capacity to have the 'hard to have conversations': Teachers in collaborative settings often find the 'elephants in the room' are less to do with contrasting philosophical opinions, and more to do with the small stuff, such as tidiness and timeliness. Identifying ways forward when things don't work, establishing protocols for important conversations, and sharing constructive and timely feedback, is important. True collaboration and team effectiveness is highly contingent on trust, such as that built through ongoing conversations – including about the 'elephants in the room'.

7. Knowing self: As part of the collaborative jig-saw, a critical and often overlooked step is that of developing an 'understanding of self', as well as developing an understanding of the team. Understanding what different people bring to the team, how they prefer to communicate, and how they learn, is useful in growing self-awareness and teamwork. Some schools have used tools like the Myers Briggs personality indicator to open up conversations and grow mindfulness of peoples' preferred forms of behaviour. How do I react under pressure? How well do I compromise? What motivates me?

8. Using the space: Co-constructing understandings about the purpose and usage of different learning settings (socio-spatial settings) within shared spaces can help ensure that common expectations are included in the development and provides the opportunity to maximise the affordances of new spaces. As Fisher (2004) noted, building teachers' 'spatial literacy' forms a key component of the occupation of new learning environments. For many of us coming from 'single-cell' classrooms, this is not something we have had to consider in great detail. Consequently, dedicating time to understanding the opportunities afforded by new spaces will help us to not only the navigate the spaces but negotiate new relationships with them.

For many teachers, working collaboratively in new generation learning spaces represents a paradigm shift in the way we have operated. What was once private practice in a traditional classroom has become highly visible to others, and once autonomous domains have become collectively owned. 'My space' has become 'our space', and 'my students' has become 'our students'. While close geographical proximity presents opportunities for teachers, it also presents challenges at professional, social, cultural and cognitive levels. Effective teacher collaboration takes time, negotiation and ongoing systemic support, and may be shaped and reshaped over time. What works this year, with this cohort of students, may not work next year with a different group of students.

As teachers, we are accustomed to creating systems and structures to support student learning. These might account for time, assessment, teacher accountability, or curriculum planning, and be designed to create efficiencies and maximise learning. Moving into shared spaces takes us into new conceptualisations of teacher collaboration and asks us to develop congruent support mechanisms. This work is ongoing in schools across Australia and New Zealand and other parts of the world. New norms have been established in some schools, but for the most part the development of new structures for the productive inhabitation of shared learning spaces is an ongoing process of educational change/development.

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Photos courtesy of Chris Bradbeer.

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New learning environments

DAVID CLARKE

Reconceptualising partnerships between educators and architects

As an architect working in the education sector for the past 15 years, I have been privileged to gain insight into the inner workings of primary and secondary schools across the Public, Independent and Catholic systems in ACT and NSW. During this time, I have watched as contemporary learning spaces designed by our practice have been introduced to school communities, and viewed with interest as their potentials have been realised, or not. As patterns have emerged, I have become particularly interested in the ways school communities interact with the design process and how this influences the physical outcomes of design and their patterns of using new facilities.

New learning spaces

The pervasiveness of contemporary learning theory as a driver of the design of new learning spaces appears to have a momentum all of its own, despite the paucity of empirical evidence showing that learning spaces have the intended impact. Indeed, some research indicates that the effect size of the type of classroom environment that students inhabit on their academic achievement is close to zero (Hattie, 2008). Regardless, there seems to be growing consensus that new school buildings matter. As Mulcahy, Cleveland, and Aberton (2015) have it, 'new school buildings matter, not as discrete objects with properties of openness and flexibility, but as effects of *materialising* processes in which school personnel and objects take part'. That is, the pedagogical considerations take

precedence and spatial arrangements become subservient to educational purpose. Although such a view may seem heretical to some of my architectural colleagues, my experience largely supports this view.

Most architects working in the education field are more than capable of designing flexible, light-filled, technology-saturated spaces. Furthermore, we are well informed about student-centric pedagogies and largely convinced of the ability for our designs to accommodate inquiry-based multi-modal learning and act as critical agents in preparing students for learning in a rapidly changing world. But what occurs when a new facility is introduced to a teacher cohort that is critical of the new spaces and the implicit changes required of their teaching practices? As architects, we may have diligently and expertly executed our role to design spaces that accurately reflect the brief. However, the product may be reinterpreted (read 'converted') by individual teachers into teacher-centric cells, with sliding glass doors closed and resources taped to windows to create privacy, or worse, the new physical environment might have initiated a slide in staff morale and catalysed cynicism towards the school leadership team. In some circles, the sense that design is in advance of pedagogy is gaining currency. But why?

Those antipathetic to the concept of New Generation Learning Spaces (NGLSs) often point to the 'open-plan' school movement of the 1970s as evidence that current ideas about contemporary learning spaces are not new at all. Interestingly, the 1970s movement is now largely regarded as a failure, not because the child-centred theories underpinning this period of spatial development were misguided, but because the movement represented 'innovation without change' (Adelman & Walker, 1974). In Australia, open-plan schools were handed to schools by local education authorities with little or no attention to training (Brogden, 2007). My observations have led me to believe that the shadows of this misalignment sometimes fall across current attempts to introduce new spaces into ill-prepared school communities.

What really matters?

My experience has shown that for NGLSs to be successfully utilised, two critical requirements need to be in place, neither of which relate directly to building design. Firstly, a school culture must exist that encourages and supports student-centred pedagogies and acknowledges the physical/environmental, pedagogical, social/interpersonal, intrapersonal, technological and process-related components of learning environments (Fisher & Abbasi, 2010). Secondly, teachers must already be familiar with student-centred teaching and assessment practices, or they must be granted sufficient professional development opportunities to engage and prepare them to work effectively in the new facilities. This requires an effective professional development programme specifically targeted at changing practice, with appropriate training for teachers that doesn't add significantly to their workloads.

The value of strong leadership and the importance of a clear vision for transitioning from traditional to new generation teaching and learning practices cannot be underestimated. My observations have indicated that effective communication from school principals is required to motivate teachers to commit to the journey.

So, what part can architects play in assisting school communities to improve the chances of successfully implementing spatial and pedagogical change?

Architects as agents of change

Most projects that I have been involved in have been led by a Project Control Group that oversees the design and construction of the new facility. Typically, this includes the principal, deputy principal, key senior staff and the business manager. In government projects, there is usually also a nominated project officer. Unless our practice has been involved in the preparation of a funding application for the facility, we are introduced into most projects only after the key decisions have been made about capacity and function. As such, our role is considered to relate only to the design of the physical space within budgetary and other constraints.

The perception of architects as only physical space planners denies a significant part of their architectural education and experience. Architects as 'design thinkers' are skilled in drawing together multiple and often conflicting motivations, considering them within a broader context and providing options for the consideration of alternative solutions that may not be available through more traditional or linear processes. Architects are therefore uniquely positioned to be used as 'agents of change' by schools amidst the complex processes of shifting a community towards more contemporary pedagogies. The introduction of the architect as an independent professional can have a number of benefits that are perhaps not often associated with their role. In particular, they can provide information about new learning environments and the pedagogical concepts driving such design, and share national and international examples of both new spaces and new pedagogies.

Experienced and appropriately qualified architects can also take the pressure off organisations by diffusing the top-down imperative for change when given the opportunity to talk to staff/parent groups/school executives at either formal events, such as information evenings or workshops, or casually. In this role, architects can be used as a resource to support organisational change with the added benefit of appearing as neutral and independent sources of information.

Case study: Organisational and spatial change at an ACT Public Primary School

This case study illustrates how architects can be deployed to contribute to the 'upstream outcomes' desired by a school, in addition to designing new spaces.

Upon commencing in a new role, a principal at a public primary school in ACT had been looking for an opportunity to set-up a Professional Learning Communities (PLC) (DuFour & Eaker, 1998) model. The beginning of her tenure at the school coincided with a government funded expansion of the school for which our practice was engaged to provide architectural services. The principal saw the opportunity to integrate the PLC concepts into the design process and final design outcomes and sought to use us to assist in this process.

Rather than being asked to respond to a set design brief, we were asked to work closely with the principal, business manager and other key staff to understand the fundamental principles of the PLC philosophy and to develop options for spaces that would support them. A core group of senior teachers were asked to develop the PLC vision, not all of whom were supportive of the mooted changes to established practices. Through an intense period of design, supported by a research-based process of educating the staff, a complete shift in work practice was achieved. Teachers formerly isolated in year group enclaves were brought together through the design of a collaborative staff work area. Professional conversation was elevated, and teaching practices were advanced to the extent that the opportunities afforded by the newly designed 'flexible' learning spaces were well utilised. The subsequent evaluation of staff attitudes towards the organisational and spatial changes revealed an almost complete consensus as to the benefits of the new arrangements.

Shifting school communities from established teaching and learning practices to embracing contemporary pedagogies is a complex and slow process. A new building project represents an exciting opportunity to catalyse this transition. Unlocking the potential of the design architect in the early phases of facility design can reinforce desired organisational and cultural change and help achieve the successful implementation of a new generation learning environment strategy.

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Photo courtesy of David Clarke.

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Configuring environments for learning?

PAUL JOHNSON

Environments have the potential to constrain, stimulate and expand learning, so when configuring learning environments, it is necessary that educators discern their criteria for satisfying long-term learning experiences. Contemporary education is changing and it is no longer sufficient that students learn facts, and to apply predetermined routines; students must learn to make sound choices and so acquire the substantive freedoms—in fact the capabilities—to choose lives they have reason to value (Scott & Gough 2009). Therefore if designs for learning spaces do not meet this requirement, other possibilities ought to be contemplated. Recently completed research in an outer-suburban primary school shows that it is possible to design learning environments that address aspirations for contemporary education. Based on this research, three essential aspects of learning environment design will be discussed.

Researching the environment's hidden curriculum

Years ago John Dewey (1976, p.277) wrote that 'the source of whatever is dead, mechanical, and formal in schools is found precisely in the subordination of the life and experience of the child to the curriculum'. By design or default, physical environments express the values and understandings of the people who build, manage and inhabit them. History shows that such environments may subordinate learning. For example, when my daughter was five she, like thousands of other children, began school. Along with two friends she had a favourite play—place called 'the cooking tree'—a place that gained its name

because one of its knot-holes served as a bowl in which the three girls 'cooked' by mixing leaves, soil and water. One playtime however, the girls discovered that the tree had been cut down. After mourning its loss they took to gathering flowers (weeds - *Oxalis pes-caprae*) but, within two weeks, this activity was also curtailed when the weeds were mowed. In any learning environment the resources, how they are arranged and the practices which govern their use, ought to express pedagogical choices but, as my daughter's experiences show, the hidden curricula of schooling can easily be overlooked.

No doubt readers of this journal are aware of John Hattie's work discussing how educators can support cognitive learning. Prominent in his work are findings indicating the effectiveness of learner feedback and Piagetian programs - findings that suggest environments should both respond to learners and draw attention to thinking processes (rather than outcomes) without imposing adult thought processes. Negative feedback of the type my daughter and her friends received is all too common and illustrates how, time and again, schools unwittingly impoverish learning. The problem is twofold: first, collective indifference to how students experience learning environments potentially constrains or eliminates valuable self-directed learning; and second, as Hiroto and Seligman (1975) explain, individuals who have little control over the events in their lives receive feedback that may lead them to respond passively to situations they encounter.

The goals of contemporary education are based in the belief that humans construct learning so learning environments should also express this belief. As the single most important variable in a learning environment educators will therefore be in a mode of constant research; seeking insights into how material, social and conceptual elements can be configured to support what, how and where students learn.

Liberating learning content, processes and trajectories

More than a century ago Frederick Engels (1881, p 54) suggested that 'the world is not to be comprehended as a complex of ready-made things, but as a complex of processes...' Today environments and learning are understood as continually emergent inter-connected processes (that involve 'ready-made things'). With this realisation comes the necessary corollary that learning environments, and their constituent parts, are 'inherently, inescapably, and necessarily relational' (Rose 2001, p.63).

Effective learning environments are configurations of interdependent people, artefacts and practices so behaviorist approaches that provide learners with information/activities are no longer accepted. Instead contemporary design proceeds, as Italian pedagogue Loris Malaguzzi (1998, p. 86), suggests 'in such a way that the children are not shaped by experience, but are the ones who give shape to it'. School timetables and curricula, old and twisted trees, oxalis flowers; all these are emergent elements that can and should be continually reconfigured to liberate learning.

In the past teachers, timetables and designers did not often liberate time and place for authentic, holistic, playful inquiries that move through acquisition of knowledge and skills into reflection and working with meaning (Sutton Smith ►

1. Research improves the likelihood that adults will perceive, and at least not impoverish, the environments students' value. Here easily overlooked loose gravel on a dolomite path provides a student with a canvass for imaginative interpretation.

2. An 'outdoor sofa' is more than an object; it is a configuration of processes that have and continue to support collective inquiry and meaning making. It is a physical manifestation of 'the substantive freedom that allows learners to choose lives they have reason to value'.

1997, p.168). Increasingly however, contemporary kindergartens, universities and workplaces see knowledge and skills (curriculum content) as tools that help interdisciplinary groups learn to address real life concerns, concepts and meanings. For example, at the primary school that inspired these perspectives, inquiries were constructed as a form of educator and student research. Beginning with educator wonderings about older students' preferences for spending time in social groups, Year 5, 6 and 7 students were encouraged to spend 10 weeks investigating and designing outdoor learning places. When student research processes were complete and an 'outdoor sofa' design had emerged student volunteers spent a day making their desired place (image 2). As they continued to enhance their creation over the next 18 months three key learnings became clear: participants learnt curriculum content and skills from Mathematical, Geographical and Design and Technology domains; content and skills were the basis for activities that engaged learners with concepts, for example, Australian Curriculum Geography's 'factors that influence ... perceptions of the liveability of places'; and these activities provided a Piagetian program that made learning tangible and mediated constructions of meaning, for example, a sense of identity, learner self-efficacy and spirit of place. Additionally, because the built artefact embodied learners' understandings, the learning that 'went into the creation' remained available to other students who saw and used the sofa.

It was McLuhan and Fiore (1967) who, when referring to the media, suggested that 'the medium is the message'. When designers and educators liberate learning environments the constitutive material, social and conceptual realities can become more than messages; the environment becomes a teacher that scaffolds contents, processes and trajectories of learning.

Design for designing

Pedagogies of liberation both overcome the problem of students forgetting the subject matter they learn in school and support concept development (Eckert, Goldman & Wenger 1997) but they do not necessarily expand participant learning. Sometimes a provocation is required. If however, students experience a provocation and their environment is tightly structured—made up of ready—made things, practices and ways of knowing–there is a possibility that learners will, like my five year-old daughter, be unable to configure satisfactory relationships. Some, who believe that students must learn to fit in with ready-made environments, may argue that this possibility is not a 'risk' but constructivists will see a profound challenge. This is because, as Anna Stetsenko (2008, p.139) tells us, constructivists insist that 'people come to know themselves and their world as well as ultimately come to be human in and through (not in addition to) the processes of collaboratively transforming their world in view of their goals and purposes'. From a constructivist perspective the significant challenge for educators and designers is thus to avoid making spaces and instead configure learning environments that encourage and support inhabitants, educators and students, to re-design the environments they encounter. Such environments need not be high-cost nor high-tech (image 3). Here low plants, loose parts and rules that allow children to reconfigure elements help learners, as Helen Hedges (2010, p.33) suggests, lead interesting, fulfilling and meaningful lives as participants in their school.

Clearly no template can exist because to create contemporary learning environments, every difference makes a difference. However, it is possible to discern that such environments will begin to exhibit the very qualities that are expected of human teachers. By paraphrasing just three of the Australian Professional Standards for Teachers (APST) (AITSL 2011) criteria, we can perceive that contemporary learning environments will be: 'differentiated to meet the learning needs of students across the full range of abilities'; 'improve the selection and sequencing of content'; and 'enable students to use knowledge, skills, problem solving and critical and creative thinking.' When designers and educators configure environments which meet APST aspirations, then contemporary education would have been truly designed for.

It is difficult for environments that are comprised of ready-made things, practices and ways of knowing to meet ambitions for situated and responsive

learning. For this reason, rather than preferencing safety, curriculum content, nature-play or any other activity, contemporary educational design is ideally approached from the perspective that the environment is a teacher. Designs will then promote sustained, emplaced engagement in collaborative exploration and re-design of contexts, contents and concepts and thereby animate student and educator capabilities to choose lives they have reason to value.

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Photos courtesy of Paul Johnson.

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3. Designed for re-designing: Low plants (90cm tall) enclose three sides of a 1.2m diameter circle, a tree provides shade, and loose parts and rules allow children to adapt the place.

JANE MEREWETHER

More than playgrounds

Outdoor spaces in pedagogical settings

For many years I taught in an early learning centre where the outdoor area was dominated by grass. I put a lot of thought into ensuring the indoor environment was a stimulating space that acted as a 'third educator' (Gandini, 2012). However, these efforts did not extend to the outdoor space, because at the time, I saw it primarily as a place for children to 'let-off steam'. In an attempt to gain more classroom space, I moved my practice to 'indoor/outdoor', whereby children could freely move between both areas. In doing so, I noticed the majority of children opted to be outside, even though it was uninspiring compared to the inside. This prompted me to explore ways to capitalise on children's preference to be outside and led to a redevelopment of the outdoor space. This included the replacement of much of the grass with shrubs, ground covers and climbers, which were arranged into semi-enclosed 'rooms' that welcomed small groups of children, and the introduction of sensory elements such as sand, water and musical instruments.

Once this area was established, I never ceased to marvel at the possibilities it offered for learning of the required curriculum, and well beyond. I witnessed children's creative and sustained engagement at a level I had not previously encountered in my teaching. The learning opportunities burgeoned to a point where it was not really necessary to be indoors, except on days of extreme weather such as high winds or temperatures. In addition, there were far fewer accidents, incidents of aggression, and interestingly, even weekend vandalism diminished. This experience led me on a voyage that now includes PhD research. It has led me to realise that the potential of outdoor spaces is greatly underutilised in many educational settings.

Australian schools and early learning settings have long been characterised by the provision of outdoor spaces, as acknowledged by the national framework for learning in early years' settings, *The Early Years Learning Framework (EYLF):*

> *Outdoor learning spaces are a feature of Australian learning environments. They offer a vast array of possibilities not available indoors. Play spaces in natural environments include plants, trees, edible gardens, sand, rocks, mud, water and other elements from nature. These spaces invite open-ended interactions, spontaneity, risk-taking, exploration, discovery and connection with nature. (Department of Education Employment and Workplace Relations (DEEWR), 2009, pp. 15-16)*

Yet, drive past any school, or early learning centre and you are likely to see the outdoor spaces empty, or only being used for sporting or physical exercise activities. There is no denying the vital role of physical activity in enhancing health and wellbeing, but seeing outdoor spaces only in terms of exercise overlooks the potential they offer for children's daily education. However, if they are to be used as multipurpose learning spaces, they need to be appropriately provisioned.

Shade

Internationally, there is increasing awareness of schools and early learning centres such as 'Forest Schools' where children spend large amounts of time outdoors (Cumming & Nash, 2015; Knight, 2009; Slade, Lowery, & Bland, 2013). These schools are typically in cool climates and the argument is that outdoor education is only precluded by inappropriate clothing, or, as Baker and Ross-Bernstein (2014, pp. 49-66) contend, there is 'no bad weather, only bad clothing'. While it is easy to stay warm with clothing, it is more difficult to avoid harsh sun and heat.

Notwithstanding hats and sunscreen, outdoor areas devoid of shade are extremely unpleasant in temperatures above 25 degrees. In my centre we were fortunate to have several large trees that had been planted some 40 years earlier and the first thing I suggest educational settings need to do is plant trees. Shade is non-negotiable in Australian outdoor settings and shade provided by large trees is far more extensive and pleasant than anything provided by shade sails.

Natural elements

The trees at my centre played a big part in attracting children outdoors, even before the redevelopment. Trees not only give shade, but like all plants they also drop nuts, bark, flowers, leaves and sticks which provide no end of interesting 'loose parts' (Nicholson, 1972). Plants attract insects, which in turn attract birds, both of which provide endless possibilities for learning. Although, as experienced outdoor teacher Janet Robertson (2011) argues, we do not need a forest to take learning outside. But we do need plants; artificial turf and plastic equipment create stark, uninviting and ultimately useless spaces. Plants offer aesthetic, cooling, softening, and ever-changing possibilities that synthetic materials can never provide.

In negotiating the transformation of our yard, cost was a significant consideration, so we agreed the new design would not require any more maintenance than the existing lawn. Although we would have liked an Indigenous garden, we decided on common easy-to-grow garden plants as these could be obtained by donations from the school community. We gave preference to plants that stimulated the senses–that rustled in the wind, were edible, or had prolific flowers or scented foliage–plants such as bamboo, rosemary, plumbago, lavender, ►

geraniums, daisies and ornamental grasses. Importantly, these were planted into irrigated stacks of two or three tyres, which provided immediate height and protection from errant feet but also a sense of security as they were arranged to create a series of semi-enclosed spaces.

Loose parts

Other natural elements such as a pond with fish, boulders, pebbles, sand and logs were also added to create variety and interest in the space. But it was not just natural materials that created interest; we were informed by Nicholson's (1972, p. 6) theory of loose parts which states, '[i]n any environment, both the degree of inventiveness and creativity, and the possibility of discovery, are directly proportional to the number and kind of variables in it'. Large tracts of grass lack variables, so adding a variety of objects to touch, move, smell and build with is essential. These items do not need to be expensive or hard to source. Plants provide many loose parts, but simply adding a range of items such as tyres, hay bales, boxes, tubing, fabric, sacks, crates and wooden planks has been found to lead to children in primary schools being more active, social, creative and resilient (Bundy et al., 2009). This does not mean inundating the environment with materials; instead they must be chosen intentionally and with a view to aesthetics. An environment that resembles a rubbish tip is no more attractive to children than it is to adults.

Aesthetics

The educational project from Reggio Emilia in Italy has drawn attention to the importance of aesthetics in education (Edwards, Gandini, & Forman, 2012). Like indoor spaces, if learning spaces, indoors or out, are to be effective and welcoming, careful consideration must be given to choosing materials that give an overall sense of cohesion and harmony; garishly coloured equipment so often used in outdoor spaces does not achieve this. Nor do environments that are shabby and marginalised. Like indoor spaces, outdoor areas need daily attention to ensure they are clean and orderly – paths, walls, plants, and other elements must be kept tidy and well maintained.

So often, outdoor areas only cater for large groups – whole classes, or even two entire football teams. Aesthetically pleasing educational spaces need to be more flexible than this, and consideration must also be given to the creation of smaller spaces that invite people–children and adults–to work together, and individually.

Risk

Children need opportunities to be challenged and take both physical and learning risks, however, outdoor spaces are often viewed in terms of risk and danger, rather than in terms of challenge and opportunity. This can lead to uninspiring and unwelcoming spaces for children, however, as Little and Wyver (2008, p. 39) warn, 'failure to provide children with stimulating and challenging experiences through which they can engage in positive risk-taking exposes them to different risks that compromise their health and development'. Ameliorating risk on one hand, may lead to risks on the other. In my centre, there were many more accidents on the original, ostensibly hazard-free, expanse of grass. On the other hand, enriching the environment engaged children's minds and bodies, and while bumps, bruises, cuts and scratches still occurred, the severity of accidents diminished significantly.

Outdoor spaces in pedagogical settings have considerable potential to act as a third teacher across a broad range of learning areas, however, this potential is greatly restricted when only open expanses devoid of shade are all that is available. Enriching outdoor spaces with trees, plants, loose parts and clever design enables them to provide not only a context for learning but also content for learning, thus supporting a much wider range of educational options.

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DAVID SALTMARSH

Not just a facade

Blackfriar's Public School, South Australia (1885).

Female Orphan School, NSW (1818).

Perceptions of learning spaces

Today learning spaces take many forms from the familiar school classroom to the virtual world of the internet. To consider this issue let's dwell on the changing nature of learning spaces by giving attention to two schools constructed in the 19th century and the perceptions of these buildings as places of learning. The first is the Female Orphan School, completed in 1818, and the second is Blackfriars Public School, completed 67 years later in 1885. While more than 100 years old, both structures are still in use. Reviewing the ways their purpose and esteem have been understood over time allows us to look at the the ways education has been considered up to the present day.

In the latter part of the 18th century and early 19th century, an academic debate about architecture raged in England. The conflict was over whether the Classical architecture of Greece and Rome, or the Gothic styles should be revived. Classical styles were considered to represent cerebral idealism, whereas the Gothic styles reflected a more emotion-laden, rustic and religious period of medieval England.

In Australia there were few architects among the settlers and convicts until the surge of migration in the 1830s. Until then the demand for buildings was satisfied by designs that were relatively straightforward and the simple Georgian style was the predominant mode of the colonial building.

The Female Orphan School

The first Female Orphan School was set up on Norfolk Island in 1796 by Lieutenant-Governor King. When King became the Governor of the colony in 1800 his interest in rescuing 'orphan[ed] female children [who] have been lost or deserted by their parents' continued and he acquired a large house in Sydney for the purpose. It soon became apparent that the house, which could accommodate 100 girls, would soon be too small and plans were made to construct a larger, purpose-built school on Arthur's Hill near Parramatta. While King's stated concern was for the welfare of the orphaned girls, his greater concern was to introduce reforms through the creation of the Orphan Institution. It was established in the guise of benevolence, but also heralded a greater involvement of the state in the provision of education and further possibilities for social reform.

The site on Arthur's Hill and plans for the project were approved in 1800, brickmaking had begun, and staff for the school had even been requested, but building did not commence until Governor Macquarie arrived in 1810. A plan for the school, with costing, had been presented to the Orphan School Committee in September 1800, but that structure was never built. The design for the building that was built and completed in 1818 is said to have been drawn by the Governor's wife. The building is styled as a Georgian country house, based on the floor plan of Elizabeth Macquarie's family home of 'Airds' in Appin, Western Scotland. The building's location also caused controversy as the Orphan School overlooked land owned by John McArthur, a wealthy grazier. McArthur's property was positioned on the opposite side of the Parramatta River, and he was said to be annoyed at the thought of the orphan girls looking down on him. The Reverand Samuel Marsden, the Senior Chaplain for the colony, also complained that 'the Female Orphan Institution should not be like a Boarding School for Young Ladies who have some prospects in life, but rather like a House of Industry'.

Where Governor King saw the purpose of the Orphan School as for rescue and reform, Macquarie's intentions were different. For him the institution signified protection and progress. The school was in sight of the settlement at Parramatta, but not easily accessible. While the finely constructed, imposing monument irritated some of the local landed gentry, to others it symbolised the progress that was being made in the colony, where even the orphaned could gain some education and a decent transition to adult life. Landowners and farmers would have seen the school as symbolic of producing future domestic workers and virtuous wives. To members of the 'lower classes' the school could have been a monument imbued with the authority and power of the Governor and his ability to confine, train and release when it suited. The most striking evidence of the building's prominence is the aquatinted

engraving, 'View of the Female Orphan School'. In fact the school is the only non-domestic building in the collection, *Views of Australia, or New South Wales and Van Dieman's Land*, of grand houses and landscapes. Macquarie was keen to promote the colony's agricultural and commercial potential, and showcasing the school in this way to investors in England served this end. More recently the Orphan School building and the site was purchased by the University of Western Sydney (UWS) in 1995, renovated and restored, it is now proclaimed a heritage icon. An enthusiastic politician even went so far as to claim she had the honour of representing 'the nation's oldest university site'.

Blackfriars Public School

The passing of the New South Wales Public Instruction Act, 1880 succeeded in removing government financial support from church-run schools, much to the outrage and indignation of the churches. The Act sought to address the low literacy rate by ensuring a minimum education for all, but also meant new schools were needed. With the new Act, William Kemp was appointed Architect of Public Instruction, replacing George Mansfield, marking the end of the department contracting private architects to design public schools.

The architectural styles of Mansfield and Kemp were distinctly different. Mansfield's designs were gothic-inspired, often massive and asymmetrical celebrating irregularity and informality, and borrowing architectural elements from a variety of eras. Critics referred derisively to Mansfield's Cleveland Street School as a 'palace' when it was opened in 1868, but in architectural terms it was a revelation. Kemp's architectural style, on the other hand, tended to be in the Italianate classical style and some of his buildings were built of stone and very ornate. The distinction between the two architects epitomised the conflict over architectural style that had been raging in England for some time. In Australia, with the state having finally wrested control of education from the churches, the choice had been made to move on from the emotion laden gothic designs. Federation was not far off and the prospect of independence spurred a sense of nationalism that was reflected in the authority and grandeur of school buildings.

These were the heady circumstances in which the Blackfriars Public School was built. The school anticipated enrolling 1500 students, 'possibly the largest school building project undertaken at any one time in the 19th century'. The decision to build a school of that size is hard to explain given the existing schools in the area. The site was reclaimed swamp that regularly flooded, and was immediately next to a Catholic school. In fact, building the school required the department to resume land from the adjoining Catholic Church site in 1881. Many saw this as 'a deliberate act of sectarian bigotry'. Curiously, Kemp claimed to be too busy to undertake Blackfriars and Mansfield was appointed the architect of this massive project that was completed in April 1885. Perhaps it was the public popularity of the gothic, picturesque style that influenced Kemp to decline the project, or the anticipation of a backlash that a more modern design might create. By June of that year only 792 students had been enrolled, leaving space for other activities. In 1906 the first fully-equipped kindergarten was opened in the school, and was the first in Australia to adopt the methods of Maria Montessori. In the same year the Sydney Teachers College was established in part of the Blackfriars School. The creation of the college came about due to public dissatisfaction with the pupil-teacher system of teacher education, and Blackfriars provided the opportunity to develop an innovative non-residential, co-education facility.

Another initiative at Blackfriars occurred in 1924 with the establishment of the NSW Correspondence School. As this means of providing distance education developed, including the School of the Air broadcasts and the magazine Outpost, it gained an international reputation for excellence and innovation. By the 1950s the Correspondence School had pupils throughout the Asia-Pacific region, the children of diplomats and servicemen with women among them and students studying in prisons. Students could now complete up to Year 11 using this service. In 1965 the Correspondence School at Blackfriars was considered too cramped and antiquated for the 380 teachers who worked there, and gradually they were removed to offices. For some staff the shift out of the atmosphere of an authentic school environment made it impossible to continue.

In 1996 the Blackfriars site achieved another 'first' when University of Technology Sydney (UTS) purchased the heritage-listed buildings to house its new Shopfront Program. The program aimed to foster a new culture of equity, diversity, social responsibility and respect between UTS and the broader community. But Shopfront signaled a change of greater significance than just a changed use of space. The appropriation of this space built to symbolise the modernist endeavours of forming national character and promoting progress, could now be seen to be celebrating the more postmodern concerns of difference, pluralism and heterogeneity. Like reimagining the Female Orphan School learning space, Blackfriars has been transformed in ways that could not have been envisaged when first built as a school.

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Photos courtesy of David Saltmarsh.

MERWEZ WHALEBOAT

Traditional knowledge systems and real time learning spaces

Since our country was first colonised and our ancient knowledge system was confronted with new, foreign western ideologies, two competing knowledge systems have been vying for the minds of our Indigenous children. Ancient knowledge systems that define identity and peaceful connectivity to all living things are slowly dying, only to be replaced by the increasingly fast-paced western knowledge system that can comprise ideals such as 'individualism' and 'capitalism'. This knowledge system is continuously taught in the confined spaces of sterile classrooms, with easy access to 'smarter' technologies that stimulate and encourage learners to venture into the outside world by 'googling' or downloading an application. Today, this is becoming more the norm, and it is like staring down a narrow telescope at men in uniforms packing information in boxes. It is up to the individual to discover, unpack and process the complexities of the information.

However, Indigenous knowledge systems begin where the sun rises and sets, with everything in between connected to all living things. The classroom is the environment where hands-on learning takes place, learning to encourage higher functional thinking and the association of being a vital member of a group. Assessments are rites of passage which celebrate and distinguish the achievement of the group by the wider clan/community. The teaching space is not enclosed, but placed in real life environment with content like learning hunting techniques, Indigenous astronomy, environmental studies, marine biology, land management and cultural lore that define how an individual is responsible for the caring of their country with special focus on sacred sites both on land and sea. Sadly, traditional knowledge systems that have been operating for thousands of years are not being appreciated and valued less widely in western society.

Recently and positively, school strategies to engage Indigenous students are beginning to implement cultural knowledge to ensure retention and better learning outcomes, for example, activities like turtle tagging on country are being held, with support from local traditional owners, to deliver customary philosophy to urban students with a special focus on survival techniques on land and sea. These strategies assist with the building up of young Indigenous people by defining their identities and self-esteem and teaching traditional skills to develop higher functional thinking and a strong mindset.

By making these kinds of positive choices, that receive overall positive learning outcomes, assists in ensuring our precious Indigenous culture is maintained. Teaching in a classroom and on country is, and will further continue developing a new generation towards success. And more importantly our Indigenous culture will be kept carefully intact and passed on to the next generation of Indigenous Australians.

Merwez Whaleboat is a Torres Strait Island woman who teaches at Shalom Christian College, Townsville. Shalom is an Indigenous school catering predominately for remote traditional communities. By Grattan Institute analysis of NAPLAN results, Shalom was the most improved Australian high school between 2008 and 2012.

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