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For more information about the development of the Charter for Children’s Learning at the Royal Children’s Hospital, contact julie.green@rch.org.au
Introduction

This literature review is the first stage in a project to develop an evidence-based Charter for Children’s Learning at the The Royal Children’s Hospital (RCH), Melbourne.

As the leading provider of paediatric health care in Victoria, the RCH is an important site for children who spend vital hours of their lives having their health needs met. Children who experience poor health are at higher risk of lower educational achievement. They are more likely to experience academic failure (Needhan, Crosnoe & Muller, 2004), less likely to complete high school (Conley & Bennett, 2000) and less likely to go on to post-secondary education – transitions that are critical to their later occupational attainment, earning ability and quality of life (Haas & Fosse, 2008).

The early years of children’s lives are particularly important to laying the foundations for literacy and for children’s perceptions of themselves as learners. Strong links between health and education during hospitalisation are, therefore, critical to children’s longer term outcomes.

The development of a Charter for Children’s Learning at the RCH is intended to build on the current evidence base and inform a hospital-wide approach to provide children and young people with an alternative and engaging learning site during periods of health care.

A Charter for Children’s Learning at The Royal Children’s Hospital

The Charter project, led by the RCH Education Institute, links the health of children attending the RCH with the development of a sustainable, hospital-wide approach to simultaneously support children’s learning and education during their time at the RCH. It is particularly focused on creating a rich environment for children and young people in the new RCH, due to be opened late 2011.

The development of the Charter is underpinned by contemporary understandings about children’s learning and a philosophy to assist children to engage with hospital-based learning spaces that are complementary to learning at school. The project focuses on children attending the RCH who are in the pre-school, primary- and secondary-school years (3-18 years) and their families.

Children are constant seekers of knowledge from their life situations and are participants in their own development (Shonkoff & Phillips, 2000). It is important that children’s learning stays relevant to their lives and that they engage with alternative learning spaces and places that lie beyond school (Comber, Nixon & Reid, 2007).

While many paediatric hospitals worldwide, including the RCH, have education services that support the maintenance of children’s connection with their schools and school communities, there is no known research that has attempted to develop a Charter for learning or studied a children’s hospital as an alternative learning site that promotes rich, high quality learning environments, hospital-wide.

This literature review provides a platform for the Charter project. It outlines relevant educational theory, practice and policy and highlights the role that effective spaces play in best practice to teaching and learning in schools and out-of-school environments. It examines the literature on successful cultural

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shifts in the adaptation to new learning spaces, including the contribution of the Arts and innovative use of e-learning technologies.

Given the scope of the Charter for children 3-18 years, the review outlines developmental stages of learning for children and young people in this age range and the place that consultation with young people about their learning preferences has in education. The literature review concludes with an overview of Victorian government education policies on the creative use of spaces for learning.

**The relationship between education and learners**

Currently, the institutional relationships between education, curriculum and the learner are being re-examined. Clearer pictures of what pedagogies might constitute in the 21st century are emerging. Central to this is a developing awareness of the need for diverse learning spaces that offer multiple approaches to the acquisition of knowledge skills and more emphasis on learner-learner as well as teacher-learner interactions. The philosophy of a small school established by a far-sighted educator demonstrates how it placed the needs of young people centrally through both place and pedagogy:

*The future belongs to young people who know how to create and participate in learning communities; who know where knowledge is, how to get it, how to think about it and how to use it. They are the ones who will be able to take the greatest advantage of whatever opportunities an unpredictable and rapidly changing world throws their way. The best way to expose students to the Information Age is to place them right in the middle of it*.

Twenty-first century learning models, with their emphasis on collaborative project- and inquiry-based models, together with wireless technologies, have led to what is often described as anywhere, anytime, ubiquitous learning. New partnerships between learners, educators and the community members open up the possibility of learning across institutions, engagement with informal as well as formal learning spaces, different individuals and organisations and the creation of flexible learning communities. This, combined with calls to personalise learning, suggests the need to cater for different learning styles, needs and interests and a greater choice over what, where and how they learn and who they learn with.

Despenza-Green (Director of the National School Initiative, Chicago, in Rudd et al., 2006) stressed that before thinking about the physical, educators need to consider what sort of education they want for their students and check the extent to which their existing physical structures enable it. The OECD’s *Schooling for Tomorrow* group³ believed that immediate contextual dimensions such as partnerships with the community, wide cultural influences and critical factors such as the role of the learner, the organisation and pedagogy are all crucial.

In relation to children’s health and wellbeing, new learning spaces – indoor and outdoor – could have embedded “tactile, sensory and playful learning tools firmly within the design process, thereby creating both very different and non-threatening environments” (Rudd et al., p. 8).

Observation of students’ preferred learning places has led to the provision of new informal learning spaces resembling cafes, lobbies, student union areas, viewing rooms, and library nooks together with multipurpose spaces and classrooms. Given clear teaching and learning aims and appropriate usage, almost any space can be a field for learning.

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² PS1 Charter School, Denver, USA set up by Rexford Brown (Author of *Schools of Thought*, 1993) in the late 1990s.
³ [www.oecd.org/topic/](http://www.oecd.org/topic/)
A brief overview of relevant educational theory, practice and policy

The principles and beliefs of the pedagogical models of constructivism (e.g. Krause et al., 2003), authentic learning (e.g. Newmann & Associates, 1996) together with critical theory (with its foundations in Friere), and Lave and Wenger’s (1991) concept of communities of situated learning are being interwoven with the principles of design and usage of built environments in the 21st century. The elements of interactive, dynamic and creative spaces, visual transparency and appropriate acoustic containment are all viewed as vital components of educational spaces (Featherston4). A shared understanding of appropriate pedagogical practices needs to be in place as educators and students occupy new spaces.

In a learning model called “critical activism” (Hildebrand, 1999) students learn to be actively critical with/in a community. It is this model that the new pedagogies foster and innovative learning spaces support.

Generally, educators who use constructivist approaches favour the inquiry and/or problem based learning models (from Perkins, Paul, Gardner, etc) underpinned by Vygotsky’s belief (1986) that meaningful knowledge is constructed within socio-cultural contexts where shared understandings develop through interactions with others and where the teacher supports or “scaffolds” the students’ learning. It is commonly recognised that people have preferred thinking and learning modes and different attention spans and that learning spaces can provide the environment to foster individual development. Catering for individuals might mean designing spaces for kinaesthetic, auditory, spatial, personal, interpersonal and visual learning (referring back to Howard Gardner’s ‘Intelligences’, 1983 & 1993).

The provision of flexible learning spaces has been found to prompt staff members to form close relationships with their peers and students. Team building and collaborative teaching models lead both teachers and their students to enjoy new teaching and learning models. On occupation of the new spaces, behaviour management issues are said to no longer be an issue. It is believed this is because students feel privileged to belong to specially designed spaces that have eradicated the ‘stage’ for misbehaviour and the new pedagogies are engaging them.

The requirements of state curriculum documents (e.g. Victorian Essential Learning Standards) and national Australian curriculum frameworks need to be understood in the context of the physical environments necessary to support 21st century learning. Based on the findings of the Middle Years Research and Development Project’s findings (MYRAD) (Hill and Russell, 1999), the Principles of Learning and Teaching (P-12) (PoLT) have driven a reflective process in which educators have engaged in conversations about pedagogical practice (Cara, 2009) that can be used to build these understandings.

The Constructivist learning model and new initiatives such as the use of Conceive, Design, Implement, Operate (CDIO - www.cdio.org), along with planning aids such as the Victorian Department of Education and Early Childhood’s e5 Instructional Model (Engage, Explore, Explain, Elaborate, Evaluate) can be used to explore alternatives to traditional curriculum delivery modalities.

The role effective spaces play in connection with best practice teaching and learning

Today, educators are expected to identify the needs of the active, whole learner while expanding their own understanding of built, natural and cultural environments as teaching and learning tools. Hospitals, for example have classrooms, lecture areas, case rooms, u-shaped rooms, multipurpose and seminar

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4 Mary Featherston, designer of school interiors in Victoria, industry partner in the ARC Linkage Project Smart Green Schools (University of Melbourne, 2008-2010).
rooms, break-out areas and recreational facilities. A study of adolescent-friendly recreational facilities (Ries et al., 2008) reminds us that physical activity improves both physical and mental health e.g. attention spans and that usage of recreational facilities is governed by physical, social, organisational and economic factors.

Taylor (2009) believed that once we learn to ‘read’ an environment, we have cultivated what she called the knowing eye. Architect Robert Peters (in Taylor, 2009) described this as a type of visual literacy that enables us to see and critically analyse the physical world and read the environment with deep understanding. Taylor believed that developing the knowing eye meant temporarily suspending the past and opening ourselves to new possibilities.

What is an effective, innovative learning environment?

For the purposes of this literature review the definition of an effective learning space is a setting in which learning takes place as an active process and fosters the capacity of learners to apply knowledge and skills flexibly and creatively in a variety of contexts.

Leaders behind the creation of effective learning environments have a distinctive approach to the ways learners, resources, technologies and facilities inter-relate. Innovative settings together with interdisciplinary and multi-level pedagogical aims, ensure that cognitive, metacognitive and socio-emotional learning needs are catered for.

The emergence of new practices, pedagogies and technologies is questioning what Tyack and Tobin (2004, in Weiss, 2007) called the existing “grammar of schooling” (a set of prescribed social, political and cultural boundaries similar to the rules of grammar in language). The variety of learning spaces and forms of communication, data retrieval and storage, and interaction with people within and beyond the “school”, have challenged the power relations embedded in the architecture that supported teacher-centred learning environments for decades.

Shifting students away from being in rows of desks where only the teacher has the freedom to move, together with the influx of new technologies, constitutes a major change for some educators because their identity, their view of the learner, and their ways of operating are challenged. Many educators will be resistant to change, but by interrogating their existing practices in the light of new learning spaces, educators, nurtured and supported by administrators, can take advantage of the spatial and temporal opportunities offered by new pedagogies and technologies.

Young people with access to technology integrate mobile and computing activities into their daily lives through telephones, email, MySpace and face-book etc. Increasingly, innovative educators are using collaborative and interactive software like wikis and blogs to extend the boundaries of their classroom (Davis, 2006, in Weiss 2007). These innovations allow for access to and from the wider world – announcements, assignments and student work can be posted, giving parents and the community monitored access to the classroom. Flexibly designed pedagogical frameworks and learning spaces that incorporate new networks and technologies are required.

According to CERI, the four elements that constitute the learning process - learners, content, organisation and “teachers” (this includes members of the community, experts, parents, other children and young people) - are always present in a learning context. Those working in learning environments aim for, and hopefully achieve, certain stated outcomes. Some basic categories around which learning could be organised and embedded in a spatial learning context appear below:

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5 This definition is based on content in a report of The Centre for Educational Research and Innovation [CERI] (OECD, 2007).
The Spatial Learning Context – Learning Processes:

- a diversity of pedagogical approaches, teaching styles and expertise
- a mix of loosely and tightly defined curriculum
- catering for a wide ability range including special needs’ learners
- face-to-face and distance learning
- collaborative groupings and individual inquiry
- involvement of experts and community members
- using community spaces and environmental resources
- rich mix of Information Communication Technology and digital resources
- guidance, feedback and outcomes.

(Learning processes and models based on the CERI Report, 2007)

Kalantis and Cope (2005), writing about situated learning, advocated the need for educators to configure and re-configure the various physical and technological resources at hand to create environments that enabled student collaboration and provided opportunities to create meaningful, contextualized work. This included developing “authentic” materials that could exist independently of a classroom and spaces using technologies that enabled students to communicate with the world beyond their learning space. They saw it as important for these elements to be incorporated into both curriculum and pedagogical design.

Until recently, educators have tended to refer to the “environment” in abstract terms, usually psychological states rather than the physical form of the spaces in which they are operating. Professional development has concentrated on improving mood or quality of a learning place, not the physical space per se.

Teacher educators talk about classroom management and atmospheres conducive to learning or encouraging risk-taking. It could be inferred that the belief is that teachers’ skills can overcome physical learning environment deficiencies. Rather than the emphasis being on the teacher, Taylor (2002) believes that “The goal is to encourage the development of learning environments with an overall aesthetic that respects and empowers students, is based on the real world, and reinforces the concepts of hands-on problem solving” (2002, p.28). For example, if the desire is for young people to develop curatorial skills, then assist them to collect and make objects and design settings with display and storage spaces. In this way learning will be related to life. The following example illustrates these characteristics of real-world, hands-on learning:

An educational example

A diverse learning community might comprise a network of educators who seize learning opportunities wherever and whenever they appear. Parents, students, teachers, health professionals etc could work together to design and contribute to fresh and challenging interdisciplinary and differentiated learning experiences for both disadvantaged and able students, maximizing the use of the available spaces and technologies. For example: Internships – linked to with (other) schools, businesses and organizations, Community learning – participation in community projects, Student-taught classes – developing materials to be taught to other learners, and Projects – in collaboration with learners within and outside the learning setting. There could be an emphasis on performance for, and presentation to, various communities (parents and wider) in a range of spaces and the opportunity to attend workshops physically and on line e.g. scientific experiments and

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6 This example is drawn from development of the content of a PS1 Charter School Curriculum Guide, Denver Colorado. (Accessed 2002.) School founder Rexford Brown
historical surveys emanating from places like ‘The Urban/e Science Centre’ centred in the “school”. Projects could include topics like: How Stuff Works, The Power of Travel. Electives could include Sign Language, or Eastern Religious symbols’. Running a program like the above could capitalize on the urban community in which the learning centre is situated. Its extended campus could include local art galleries, museums, television stations, parks, zoos, universities, creeks, rivers and pools.

When discussing the built environment Taylor (2009) stated that behind every space structure and item of decoration or furniture there is an idea or concept. People “read” physical objects and spaces and assimilate them. This is design as pedagogy.

Physical elements in the environment can act as visual cues or prompts for learning. This is often described as three-dimensional textbooks or leaning tool. Taylor (2009) described the physical environment as a silent curriculum (p.25) that, although nearly invisible to its users and visitors to the spaces, provided positive or negative learning experiences.

Some may claim that a good teacher can teach anywhere and a willing student can learn anywhere, but this might mean they make do with poor conditions. Taylor believed the powerful effect of the physical learning environment on teaching and learning is overlooked. She quoted her own and other studies that had shown that environments affect achievement and learning outcomes (e.g. Moore and Lackney, 1992; Schneider et al., 2002).

The arrival of the Ultranet into every Victorian school and education centre in 2010 will transform communication and potentially end isolation. It is a protected online environment for users anywhere and anytime that not only provides a learning platform for teaching and learning, but also allows parents to become more involved in their children’s education. Students will be able to communicate and collaborate with other students within their school and across the state and teachers will be able to co-create curricula, collaborate with teachers at other sites, monitor student progress and provide online assessment. Parents will be able to see, among other things, learning tasks, teacher feedback and learning progress.

New technologies can also transform the feel of a space so that it feels safe, quiet and stimulating. Lighting can be activated by sensors, programmed sounds can be fed in, pictures, videos and screens can relay powerful images and text, and new acoustic treatments benefit most rooms used for speech and music.

**Developmental stages of learning for children and young people**

All age groups share the need to belong, have a sense of ownership of learning spaces, experience feelings of familiarity and security, and operate in spaces that facilitate routine while supporting diversity. Young people also need to increasingly be able to experience independence, develop a sense of self, appreciate diversity and build relationships as they move through stages of development. As they move towards the middle years, the need for privacy means that opportunities for young people to ‘retreat’ or ‘escape’ are required without impeding behaviour management. At all ages it is important for them to contribute to, and feel validated by, family and community (Rubida: www.rubida.net).

As the stages of learning and maturity progress (e.g. Piaget (cognitive), Kohlberg (moral) http://www.aggelia.com/htdocs/kohlberg.shtml), the need for flexibility of the space increases until, in the final stages of learning, the environment provides a range of spaces and facilities that respond to individual needs.

The extent of acoustic separation required at all stages is determined by the learning activities’ requirements. The range and quantity of interactive, creative and reflective zones offered also need to

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7 Source: PS1 Curriculum guide.
correspond with age and pedagogies. Stages of learning, relevant to the Charter project, are described below and summarised in Table 1:

**Early years (age 3-8):** Children require spaces that: invite and support a strong presence of family and community, enable guided activities, facilitate routine, and offer security and familiarity. Opportunities for retreating, brief interactions and activities, one-to-one withdrawal, constant supervision, and building a sense of ownership and place are required.

Montessori, whose influence on early years’ education has reverberated since the early 1900s, was amazed at how children’s attention could be transfixed by objects in the world around them. Believing that effective learning spaces were those designed to promote exploration and individualised learning. Spatial organisation became a key to her educational theory – still influential today.

**Years 3-4 (age 8-10):** Children in this age group are becoming more independent learners and their peer interaction is increasing. Routine, ownership and a space to belong to are still vital, as are family and community presence. Activities, whilst still highly structured, need to offer opportunities for the building of confidence when dealing increasingly with diverse groups of people. One-to-one withdrawal areas are still required, as are areas that allow for conflict resolution. Students are increasingly able to spend quiet time and complete tasks alone. The latter can be viewed as an indicator of behaviour management. A ‘home’ room is vital.

**Years 5-8 (age 10-15):** Children and young people are beginning to connect strongly with their peers and the wider community and interact in an independent manner. There is a strong need to retreat and reflect at times while still needing the security of structure, routine and family presence. While one-on-one work and guided conflict resolution are still required, from this age, students learn to make choices about appropriate behaviour and ways of applying the skills they have developed. Due to the belief that students should belong to the whole space, there may be no fixed space for student belongings. They also begin to interact with a broad range of people in an independent way and understand the wider community.

**Years 9-10 (age 15-16):** Young people have a strong sense of self, are reliant on communication and interaction with peers in a variety of spaces, but also need opportunities for independent work and quiet time. They need withdrawal (small group) and private and communal areas, but do not require a fixed space for their belongings. They interact with a broad range of people including the wider community.

**Senior Secondary years (age 16-18 years):** Young people are beginning to pursue individual pathways and have developed independent working habits although still requiring structure, communal and private spaces and opportunities for peer interaction. Quiet or ‘free’ spaces are important for adolescents for reading, researching, doing homework, or merely ‘escaping’ from others.

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9 Featherston constantly refers to Montessori when describing her own designs.
<table>
<thead>
<tr>
<th>Age</th>
<th>Characteristics important to learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early years</td>
<td>Spaces that:</td>
</tr>
<tr>
<td>(age 3-8)</td>
<td>- invite and support a strong presence of family and community</td>
</tr>
<tr>
<td></td>
<td>- enable guided activities, facilitate routine, and offer security and familiarity</td>
</tr>
<tr>
<td></td>
<td>Opportunities for retreating</td>
</tr>
<tr>
<td></td>
<td>Brief interactions and activities</td>
</tr>
<tr>
<td></td>
<td>One-to-one withdrawal</td>
</tr>
<tr>
<td></td>
<td>Constant supervision</td>
</tr>
<tr>
<td></td>
<td>Building a sense of ownership and place</td>
</tr>
<tr>
<td>Years 3-4</td>
<td>Growing independence as a learner</td>
</tr>
<tr>
<td>(age 8-10)</td>
<td>Increasing peer interaction</td>
</tr>
<tr>
<td></td>
<td>Increasing ability to spend quiet time and complete tasks alone</td>
</tr>
<tr>
<td></td>
<td>Family and community presence</td>
</tr>
<tr>
<td></td>
<td>Opportunities for the building of confidence when dealing increasingly with diverse groups of people</td>
</tr>
<tr>
<td></td>
<td>Spaces that provide for:</td>
</tr>
<tr>
<td></td>
<td>- A sense of ownership and belonging</td>
</tr>
<tr>
<td></td>
<td>- One-to-one withdrawal</td>
</tr>
<tr>
<td></td>
<td>- Conflict resolution.</td>
</tr>
<tr>
<td></td>
<td>- A ‘home’ room</td>
</tr>
<tr>
<td>Years 5-8</td>
<td>Stronger connection with peers and the wider community</td>
</tr>
<tr>
<td>(age 10-15)</td>
<td>Growing independence and interaction with a broader range of people</td>
</tr>
<tr>
<td></td>
<td>Strong need to retreat and reflect at times</td>
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<tr>
<td></td>
<td>Still needing the security of structure and routine and family presence</td>
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<tr>
<td></td>
<td>Needing one-on-one work and guided conflict resolution</td>
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<tr>
<td></td>
<td>Learning to make choices about appropriate behaviour and ways of applying new skills</td>
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<tr>
<td></td>
<td>Belief that students should belong to the whole space</td>
</tr>
<tr>
<td>Years 9-10</td>
<td>Having a strong sense of self</td>
</tr>
<tr>
<td>(age 15-16)</td>
<td>Reliant on communication and interaction with peers in a variety of spaces</td>
</tr>
<tr>
<td></td>
<td>Spaces and opportunities that:</td>
</tr>
<tr>
<td></td>
<td>- facilitate withdrawal (small group) and private and communal areas</td>
</tr>
<tr>
<td></td>
<td>- foster independent work and quiet time</td>
</tr>
<tr>
<td></td>
<td>Needing to interact with a broad range of people including the wider community</td>
</tr>
<tr>
<td>Years 11-12</td>
<td>Beginning to pursue individual pathways</td>
</tr>
<tr>
<td>(age 16-18)</td>
<td>Developed independent working habits although still requiring structure</td>
</tr>
<tr>
<td></td>
<td>Spaces and opportunities that:</td>
</tr>
<tr>
<td></td>
<td>- are both communal and private</td>
</tr>
<tr>
<td></td>
<td>- allow for peer interaction</td>
</tr>
<tr>
<td></td>
<td>- are quiet or ‘free’ spaces for reading, researching, or doing homework, or merely ‘escaping’ from others</td>
</tr>
</tbody>
</table>

As they mature, students are increasingly willing and able to explore the meaning of space and design and describe their preferred spaces according to personal needs, educational activities and relationships with other people. Back (1998), writing on privacy in hospitals and adolescence, said it is considered important by adolescents, especially those who were frequently admitted, to have some control over such spaces (i.e. not being interrupted or walked in on). Privacy, according to Back, included solitude, anonymity, intimacy and reserve. This knowledge, s/he believed, necessitated researchers to examine the meaning given to space. S/he found that adolescents were not in denial
about being in hospital for treatment and had incorporated this into their spatial needs without identifying solutions that were excessive or unrealistic.

**Consulting children and young people about their preferences**

New pedagogical approaches cater for relationships between children and young people of varied ages and stages. What features would spaces that cater for knowledge exchange and mentoring between mixed ages and stages – a scenario that might occur in hospital learning spaces - require? Children and young people could be asked their opinion, a practice that is on the increase in some Australian hospitals through youth advisory councils and consumer representation processes\(^{10}\).

The issue of encouraging and including the young person’s voice has been highlighted in the recent findings of The University of Melbourne’s *Keeping Connected* Australian Research Council and RCH Education Institute funded project (Yates et al., 2010). The 31 young people with health conditions played a central role in producing visual and narrative accounts of the stories they want health and education professionals to hear about their needs and experiences, including their institutional encounters. The study highlights wide-ranging diversity of experiences, needs and views of young people in dealing with their health conditions, and that their voice – as well as that of effective advocates – is an important element in improving outcomes for young people. Further, the *Keeping Connected* findings underscore the need for hospitals in which young people spend time to acknowledge and support their pursuit of education as a vital part of their overall health and wellbeing.

Lave and Wenger (1991) described how participation in learning is also structured by power relations with the design of learning spaces allowing for certain kinds of participation while excluding others. In order to change the use of space it is necessary to reinvent what the ‘architecture’ of the learning space says about modes of participation. This often causes existing ‘power relations’ to be de-stabilised. Consultation with all potential users, ensuring they participate in discussions about, and trial the use of new spaces, is therefore essential. Part of this process will involve finding ways of ‘making’ people look at spaces and objects in a different way and assisting them to gain insight into the potential of things they see in their everyday life but don’t think about, e.g. the content of a painting or the design of a table. This could be described as developing people’s “Spatial Intelligence” (Gardner, 1983).

**Relationships between spatial designers and clients**

Taylor (2002) believed that educators should provide architects and the community with an “academic blueprint” as they contemplate new or refurbished education facilities design. This entails certain spatial understandings. Further, she believed that “architects have a reciprocal responsibility to teach the public that the design of physical spaces matters, and that they can be read and translated by our minds into ideas for better understanding of our relationship with the environment” (2002, p. 31).

It is important for designers to understand the new educational pedagogies and produce more innovative learning environments. Educators, students and school community representatives and designers should collaboratively explore how ICT, space and place can impact on or support their pedagogical practices. New builds give clients the opportunity to “reengineer” ICT, space, and place in connection with the pedagogical and operational cultures of schools, departments and other educational units. (See *The New Learning Environment: Hybrid Designs for Hybrid Learning* www.woodsbagot.com.au/.../ PUBLIC2%20The%20New%20Learning%20Environment.pdf.)

\(^{10}\) The Royal Children’s Hospital, for example, has its Youth Advisory Council – Y@K – and a commitment to being an adolescent friendly hospital through its Adolescent Model of Care work program.
Designers need to get to the bottom of how and why teachers, other professionals and students currently operate the way they do. This requires consultation, collaboration and “co-construction” of learning environments and time for the various professions to learn each others’ vocabulary.

Nair and Fielding (http://designshare.com/patterns Accessed 30.5.10) believed that educators’ lack of common design vocabulary and graphic pattern language meant that designers needed to be provided with diagrammatic patterns (i.e. rough sketches of big ideas) and illustrative patterns (more detailed sketches). Plans are of little use if they can’t be understood. If health professionals and educators are to interrogate hospital spaces, they could assist designers, by, for example:

1. Naming spatial problems they foresee or have experienced.
2. Describing possible solutions for meeting their stated goals for spaces.
3. Helping the designer address their issues and questions.
4. Understanding that there can be many paths through the design [and occupation] process.

Nair, in 2005 (www.designshare.com/index.php/articles/schools-good-for-children/ accessed 30.5.10) claimed that a building that looks like a “school” may actually be saying a lot that goes beyond its architecture. No one questions that good hospital architecture is about creating effective places for healing, but if the architecture of a children’s hospital aspires to about health and learning, “shouldn’t it support various learning modalities and allow its users to constantly tailor and modify their space to meet changing needs? Shouldn’t it, most of all, be about what children need for their special developmental needs at various stages in their lives?” (Nair, 2005).

Nair raised further relevant points for hospital staff to consider when he discussed good airport architecture. Like airports, hospitals work to get people to their destinations as efficiently as possible while simultaneously attending to their physical, mental, spiritual, and learning needs as they wait or move from one part of the building to the other. Architecture, interior design, furnishings and art works all play an important role here. They can entertain, comfort and educate the users who, in the case of a paediatric hospital community, include children and young people as inpatients and outpatients, parents/guardians, siblings and extended family and others.

Brase (in Rickes, 1997) after inhabiting newly designed spaces that were not satisfactory, was able to say with hindsight that, during the planning stages, the users should have stressed that effective learning space design was critical. Brase sent on to identify that it would have been beneficial if the staff had provided the designers with unambiguous and understandable design objectives that everyone could understand and insisted that the specified criteria were specific enough to be able to hold the designers accountable. Allied with this they realized they should have required follow-up by the designers to ensure that design criteria were met.

The Department of Education and Early Childhood Development has produced excellent publications to support this process (see the section of this paper, ‘Government education policies on the creative use of spaces: the Victorian context).

The contribution of appropriate learning spaces

Spacious, light filled, dynamic and varied learning environments – formal and informal – that support varied learning modes are essential. Meeting places to learn include distributed learning areas, lecture rooms, discussion spaces, retreat areas, information centres, wet areas, projection and storage spaces, stages and mezzanines, discussion pits, counseling spaces, lounge areas, outdoor and eating areas and spaces beyond the education facility. The innovative use of specially designed furniture should accompany each space.
Interaction between staff and young people is enabled by particular spatial arrangements. Exchanges between staff-and-staff and staff-and-students can occur either in public spaces, in rooms where specific tasks are to be carried out, in smaller support spaces, and circulation spaces (e.g. landings on stairways, walls punctuated with lounges and courtyards). New ideas and different approaches come from exchanges and “You can actually feel the way the building acts as an intellectual catalyst” (Wang, in Rickes, 1997, p. 134).

In six newly-constructed hospitals Pati, Harvey and Cason (2008) interviewed staff to ascertain what features of the built environment the users’ (i.e. the health carers) believed supported or impeded different types of flexibility of inpatient medical-surgical units. The staff connected many of their built environment needs with adaptability, i.e. to meet the needs of the patients. Some of the study’s findings and recommendations that emerged from content analysis (Miles & Huberman, 1994) were of relevance to the establishment of learning spaces in similar settings, viz:

- different stakeholders will define flexibility differently and according to their role
- provide storage spaces in work areas and cabinets in rooms and by beds
- create simple layouts to improve visibility – staff-staff and staff-patient
- utilise modular, mobile carts in equipment, medication and dietary rooms
- minimise the electrical and mechanical components of rooms to optimise the potential for space conversion.

Designing learning spaces: a hospital-specific example

A group of Harvard University students undertaking a ‘Designing Learning Spaces’ unit under Dan Gilbert (2008) explored possibilities for an upgrade of The Lucile Packard Children’s Hospital School (Harvard) due for completion by 2013. Gilbert’s process for a learner-centred approach for designing learning spaces for hospitals but which equally apply elsewhere, comprised:

1. Understanding the learners and other people associated with the spaces.
2. Identifying what activities will be taking place.
3. Brainstorming and generating ideas.
4. Planning and creating: proposing and implementing solutions.
5. Measuring the outcomes.

Gilbert suggested that, in order to understand needs, his students should create young peoples’ ‘personas’ with a variety of health issues and the physical challenges each would represent. They needed to ask: What are their relationships with others like? How does this impact on their school progress? Who are their friends and to what extent do they help them – before and after hospitalisation?

The hospital staff interviewed during this project believed the personas accurately reflected real cases. They added other issues to consider like: adolescents’ reluctance to attend the hospital school because of their appearance and the feeling of isolation when friends stop visiting.

The observation phase of the spaces involved noting current use; interaction between users; attempting to understand the emotional as well as physical needs of the students; and identifying key behaviours and actions of the hospitalised students. Grounded in learning theory and the design process, the students made recommendations for the ways a hospital setting could meet young people’s academic and socio-emotional needs. Although they believed that life was not normal in almost every area of the

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11 Site access granted to researcher.
hospital, they advocated the provision of education ‘spaces’ that provided an oasis of normalcy and were respectful of the needs of individuals. First, the students asked themselves what counted as a space. They wanted to limit the extent that medical conditions limited individuals’ achieving to the best of their ability and, following observation and interviews, envisaged three learning spaces connected by a community of learners (Lave & Wenger, 1991): community, bedside learning and virtual learning – described in the footnote 12.

Items for consideration, which the students’ included as ways of assessing the effectiveness of spaces, included:

1. For the community/classroom space – the effectiveness and amount of work completed before and after the new space was used, whether more students were attending, if the space better met teacher needs, and what, if anything was required to augment or change the space to make it most effective.

2. For the “Rolling lap-desk” (the bedside learning) – amount of work completed, changes in study patterns, ease of completing work, the time it took to change the hospital space to a study space, and whether the teachers found it easy to work with.

3. For the virtual space – usage patterns by students and teachers. For students: How many logged on? How much ‘academic’ work was completed? Was there a change in quantity? Were there changes in self-image of any isolated students? For teachers: Ease of use of system and whether the system improved their connection with students.

Supporting innovative use of (e-)learning technologies

Portability and personal ownership of mobile devices increase learning opportunities in a range of spaces. They offer opportunities to capture, access, manipulate and publish information. But, according to Weiss (2007), studies show that currently, even when digital resources are integrated into learning activities, they are largely used for word processing, basic web search and keyboarding and their communicative and collaborative potential as resources is not being realised. Because they have been incorporated into existing classroom spaces in this way they are merely reaffirming the “grammar of schooling”.

12 a. Community space/classrooms. This could be something like a ‘traditional’ separate learning space that students could attend to get away from procedures, parents and nurses. To meet the students’ needs, and the learning goals they had established (ie. normal life, respect for needs, academic achievement) their design contained walk- or wheel-in storage for teachers and students, breakout spaces that allowed privacy, flexible work spaces, power outlets and cabling on floor (cordless where possible), wide walkways, moveable tables with whiteboard tops, colour for inspiration, natural light and indoor-outdoor connection. They designed personalised storage bins for students.

b. Bedside Portable Learning. Alongside IV poles and outlets for various medical devices etc, the students wanted functional learning spaces for those confined to their beds where their medical needs could be forgotten (to the extent this is possible). Although difficult to achieve given Health and Safety issues, they designed a mobile cart for bedside learning that they called a Rolling lap-desk as a possible learning space. It could be folded away, but contained a space for a laptop, a removable storage bin, a hook for a backpack, ‘in’ and ‘out’ folders, a slide out desk, and a slide out white board. They also designed a coloured, lightweight teacher’s bag consisting of slots for ‘in’ and ‘out’ folders and pockets for pens [thumb drives] etc.

c. A Virtual Learning community that united all learners without and outside the hospital environment. They proposed a virtual school classroom where students, as Avatars, could carry out experiments. Virtually the students could also link up with other students throughout the hospital, the teachers, and the hospital’s community/classroom. The students also suggested a Video streaming capacity that captured the students’ school of origin classroom to enable communication for isolated students to communicate with their school. This capacity or Skype could also link them with home.
By scattering ICT throughout the building, student-centred and directed learning is encouraged. As this paper is written, technologies are changing and innovations are constantly occurring. Today, the minimal requirements for education are a wireless network, laptop computers, phones, an electronic teaching management system and technologies that enable distributed learning – e.g. online, via Skype, video conferencing. Social software is part of students’ daily lives, e.g. blogs, wikis, and bookmarking tools. Such tools lead to shared ownership over information and content. Digital technologies offer the opportunity for flexible, distributed learning providing opportunities for learners to engage with diverse environments and force us to reconsider what learning might look like.

In the UK, Notschool for example, is an online support network of buddies, mentors and experts to support learners in non-formal learning settings (www.notschool.net/ns/template.php). Space Mission fostered new approaches to learning. It enabled learners to work collaboratively in teams using interactive material, video-conferencing and messaging to communicate with one another and remotely located experts (www.futurelab.org.uk/showcase/space_mission).

In an article evaluating radio frequency identification systems (RFIS) in hospitals, Fisher and Monahan (2008) raised relevant issues for the introduction of new education technologies for patients and other personnel and their potential to improve hospital functions. They stressed that the integration of these technologies into hospital practices often results in dramatic changes in management, division of labour, and accountability. They cautioned that the introduction of new technologies must be studied in particular social contexts and their caution can be extrapolated to information technologies associated with teaching and learning in hospital spaces. Their recommendations apply broadly:

First, hospital administrators should craft clear management goals. This includes defining, in advance, the intended goals and functions of the systems, the ways in they fit into the broader management plans of hospitals, and rationales for their use.

Second, the associated responsibilities, including operation, technical assistance, evaluation and training, should be mapped out and negotiated in collaboration with staff members prior to implementation and should be revisited periodically. Anticipating likely increases in workloads and staff surveillance and explicitly negotiating policies with staff will likely engender greater staff support and more successful incorporation of the systems.

Third, the distribution of material resources should be evaluated and planned for well in advance. Administrators and staff should assess the types of technologies and associated spatial resources required and the potential physical constraints such as storage issues.

Fourth, it is critically important that the design of such systems and interfaces are technically functional, intuitive, easy to use, and as complementary as possible to established practices and processes of delivering care at the hospital. Additionally, hospitals should expect that these systems will require ongoing investment in staff positions and technical supplies.

Fifth, the attitudes of the staff should be ascertained and should inform the range of functions for the systems in each hospital setting. It is important to ask how each group of hospital staff perceives the workload associated with the systems, stressing and demonstrating the advantages and the utility of the RFID systems for patient care and wellbeing.

Technologies must be understood within their social contexts and not as external forces applied discretely to social problems.

When thinking about the role technologies can play in both public and private arenas, a field that is receiving increased attention from scholars interested in communications theory is ‘Entertainment-
Education’ (EE). Defined by Singhal and Everett (2002, p.117) as the intentional placement of educational content into ‘entertaining’ media messages, it is an intervention strategy that can be used to disseminate ideas through entertaining media sources that bring about behavioural and social change. Today, the power of media like movies, television, music, spectator sports, newspapers, phones, advertisements and internet to influence emotions and actions, is not questioned.

Like the above, contrived EE interventions are believed capable of modelling self-efficacy – where an individual’s capacity to deal with or have control over a situation is modeled (e.g. eating the right foods to lose weight and be healthy). Interventions are also believed capable of modelling desired behaviours like taking medication or applying sunscreen. Lieberman (2001) found a positive effect of an EE game called ‘Click Health’ which was designed to assist children to live with diabetes.

Singhal and Everett (2002) also reported that research has shown that EE interventions evoke interpersonal communication between the audience, friends and relatives. EE supporters believe that emotion has the power to trigger preventable poor health behaviours (e.g. showing how a health event brought on by some kind of abuse affects a family). Such examples of EE interventions require careful aims, planning, and skillful management.

Those interested in Entertainment Education are social learning, social construction and social cognition theorists and also people interested in achieving audience involvement. The internet can always be part of EE, but it is important to remember that the less educated, poor and rural populations may have little access to it. As well, resistance to EE may come from those who view it as a ‘big brother’ intervention. To maximise acceptance, coherent, pleasurable and entertaining narratives, not too heavy-handed about the educational message, are advisable.

**Successful cultural shifts in the use of learning spaces – The future**

The emergence of digital technologies, the role of education viewed as lifelong learning, and the push to see the role of schools as resources for the community are setting up radical notions of ‘the school’. Heppell et al. at Ultralab (rubble.heppell.net/places/media/final_report.pdf) outlined four possible future scenarios that exemplified possible educational futures where educational visions included individualised, community-based and vocational approaches, where diverse uses of technology increased connectivity and delivery, and diverse learning included situated, remote and collaborative learning practices. Ultralab posed four radical directions to ponder:

1. Learners based at home, learning from experts anywhere in the world.
2. Secondary schools operating like a university with faculties each offering an area of expertise.
3. Time is spent on a campus but learning takes place whenever and wherever it is needed.
4. A school where at all times the business of formal learning was carried out with no distractions.

Alternative education visions that cause us to rethink our educational assumptions and practices include:

- ‘Classes’ contain students of any age.
- Spaces in which learners feel comfortable.
- More teachers working collaboratively in spaces.
- Spaces designed to maximise learner control of resources.
- Time and space boundaries are flexible.

Similarly, personal response systems, or “clicker” technology, are devices that allow instructors to get a quick pulse on what students understand and what topics might need further review. They are also ways to inject some active engagement into the normally passive environment and could be used in a hospital setting.
School is not compulsory.
Online experts act as mentors.
Most learning involves problem-solving and collaboration.
Informal learning is valued as much as formal learning.
Learning spaces foster relationships between people of all ages.
There is greater community and culturally-based learning and information exchange.
The curriculum is organized around spaces rather than subjects.
Learning spaces are part of ‘hubs’ enabling diversity of people, resources and community input.

Ultralab also proposed future scenarios that offer models of “ubiquitous, ambient and persuasive technologies” that can be created anywhere and cater for differentiated learning and individual learners:

1. Personalised pods where learners have their own work space with apt tools and technologies to assist their writing, researching, publishing and communicating.
2. Workflow areas that are zoned around types of activities – e.g. for research, ideas development, production and presentation.
3. Learning landscapes where individuals place media files containing images, text and audio-based 'livelinks' that play on personal devices of passers-by (by pointing their portable devices at objects in the environment). The information could include local knowledge, local history, and personal narratives.
4. Touch screens that are also work surfaces, fully-interactive and linked with personal devices and function as screens for video-conferencing with others.
5. Disused space – new place that can be quickly re-organised and linked to the local community through wireless networks to promote a sense of community development and awareness of local environmental issues.
6. Mobile production hubs – ‘vans’ with wireless connection and inbuilt digital production and editing suites are parked in available spaces.
7. Augmented reality merges real and computer-generated worlds.
8. Virtual reality enables users to interact in computer-simulated and immersive environments.
9. Transporta-cabin – an experimental experiential mobile (within a designated area) cabin serves as a showcase and a sanctuary for learners. Its focus is to transport the learner enabling them to escape and simulate environments not normally accessible and stimulate the senses.

(Paraphrased from what if…? Rudd, Clifford, Morrison and Facer – Futurelab, 2006)

The contribution of the Arts in health care – some suggested models

Gund and Dorsten (in Rickes, 1997) saw art as part of, not outside, intellectual and creative life and part of the mainstream of education. They believed that leaders could provide a vision for the place of the arts in their institution and this in turn would influence spatial design.

Gary Chard (2003), Director of the Awesome International Children’s Arts Festival (in Western Australia) is dedicated to introducing young people to a range of contemporary arts experiences that aim to enhance, promote and celebrate their individuality, expand their arts language and introduce them to the process of making works of art that communicate messages about their worlds. He described Artshed, a space that focussed on engaging young people. In it, contemporary artists worked in different mediums over 14 days in what they called an arts factory. Young people visit the space regularly [and repeatedly] as the projects developed, talked to the artists, found out about the processes and learned more about the arts community. He believed this model helped to overcome artists’ reluctance to spend time working with young people. Chard’s aim was to attract young people to visit and engage because they want to, but realised that because adults usually acted as gatekeepers, the
program needed to attract both audiences. ‘Awesome’s’ work with students centred on their own way of expressing themselves.

A project of the City of Melbourne, ArtPlay, where children and artists had the opportunity to get together and imagine, explore and create art offers another model that could be taken up elsewhere. Eco-Cubby, part of this project, offered an opportunity for young people to meet with architects to workshop how a practical and build-able design would consider function, shelter, materials and resources.

Jane Vytrhlik (2003), of the Powerhouse Museum, Sydney, saw the museum’s hallmarks as interactivity and integration and showing the influence of human creativity in the sciences and the arts. She saw the museum’s role as emphasising the lifelong importance of ‘the real’. The high-tech and design-based museum is increasingly mounting exhibitions with children’s interactive activities, even though they are ‘messy’. She explored the reasons why the Star Wars exhibition was their most successful. The museum allotted visually attractive, dedicated ‘safe’, free space within the museum for 6 weeks. It catered for different ages, and the content linked to the exhibition’s content. The content created the inspiration for the children and parents to talk and they could take away the products they made. Vytrhlik believed that the museum staff needed to teach parents as well as teachers how to use the museum.

The Light in Winter, Melbourne’s Federation Square's annual winter program celebrating the importance of ‘light’ in our multicultural community, offers another model for involvement in the arts that is not classroom-centric. In 2010, a large-scale major work by world-renowned artist Raphael Lozano-Hemmer was exhibited in the square. An associated education program was designed to support themes of ‘cultural origins’ and ‘light’ through student engagement in tour-based activities. The program began at an Indigenous campfire installation around which experienced Indigenous educators engaged students in activities such as traditional stories of the area around Melbourne, traditional music and dance. A facilitated tour of ‘Light in Winter’ artistic installations then led students around Fed Square. Activities included didjeridu playing, storytelling, Indigenous history, the story of Melbourne, Indigenous dance, and Dreamtime storytelling. Online activities and resources were provided to visitors prior to and following each tour.

A hospital-specific take on the National Gallery of Victoria’s Artie Mouse could take families on a tour of the hospital's spaces and artifacts. Parents could participate in creative adventures that reveal hidden treasures, and an opportunity to express themselves in a workshop could follow, e.g. making cut-out or constructed art pieces or sculptures, performing on stage, painting faces or decorating bodies in a ‘body art studio’ (http://www.ngv.vic.gov.au/). A web page offering virtual travel and visual artworks could be created. Photos with descriptions of what can be discovered in different places around the world could be posted. (See www.art-mouse.com/)

All the models described above could be adopted and incorporated in or as learning spaces elsewhere.

**Learning in out-of-school environments**

Both Howard Gardner (theorist) and Mary Featherston (designer) believe that a good museum provides a great model for education because of its interactive, self-directed, inquiry- and problem-based learning opportunities that focus on ‘real’ things that remain at the core of the learning experience. Lord and May (in Rickes, 1997) believed museum pieces help people understand the world around them and can be used for display, study, or the education of the viewer. They recommended that institutions re-examine their historical and cultural assets and prepare a clear vision of the role of its artifacts.

For example, significant artworks may be in secluded places, historical apparatus, photographs and other memorabilia could be in storerooms. Rather than just being displayed, an instructive program that explains the objects could be put in place so that the collection becomes an interactive and living
educational force. This might include open storage, study nooks and multi-media or on-line databases and activities. Many of the staff will be unlikely to be familiar with using objects as tools of inquiry and will need opportunities to think about ways of creating opportunities for patients and visitors to interact with the “collection”. In this way the hospital becomes a place of inquiry. Temporary displays or lectures on aspects of the collection will involve the community. An out-of-school example follows:

The Kenyon College Book Shop in Gambia, Ohio, USA, provided a spatial model that could be established within a hospital. It found that when it used stuffed grizzly bears, tents and canoe paddles to promote its camping section, children crawled into the tents to read books and used the stuffed bears as couches. Away from quiet areas it had a lounge area with couches and large windows that looked over a garden area, a newsstand, café, and convenience store. They found it had become an intellectual community centre where students wrote essays or played chess. This space is not unique – there are many similar spaces in the community today. They are both profitable businesses and intellectual and social successes. They are places where staff and students can read, eat, talk, relax, listen to music, and mix. Such places in institutions associated with young people bristle with activity and tolerate the “boisterous reverence” of the students (Finefroack, in Rickes, 1997, p. 105).

The outdoor environment

Apart from offering shelter when needed, the design of outdoor facilities can support the needs of all students through the provision of equipment and resources that meet social, recreational, learning, fitness, and quiet reflection requirements.

The landscape is the first thing people see when entering an institution. If guidelines and standards for the best arrangement of spaces, circulation, and plantings keep in mind the institution’s mission and history, it can provide a serene and sensory experience. It can also augment the institution’s educational program as well as providing positive visual memories for its occupants and visitors.

If students are to be consulted about the landscape, then asking them questions about their environment that they can comprehend are essential. Evans et al. (2007) found that the children in their study of students’ environmental attitudes found they had strong pro-environmental attitudes but not necessarily behaviors that were consistent. The researchers’ methods of obtaining attitudes were interesting. They designed a felt board on which children displayed scenarios, they created a board game with either/or choices and they had a worry thermometer on which levels of concern could be recorded.

Outdoor areas need to be well maintained, feel safe, and enable a range of activities. In a hospital environment, outdoor areas that resemble a park, could, for example have built-in games or clues to puzzles they have been asked to solve. Obviously ramps, paths and access must accommodate wheel chairs etc and hard surfaces may be required for this. Faber and Kuo (2008) when describing how ‘nature’ improved concentration levels of children with ADHD identified helpful features that could be integrated into indoor and outdoor spaces:

1. Accessible natural amenities like trees, flowers, open lawn, small bushes [and vegetables].
2. Natural amenities like aquariums, terrariums and indoor plants.
3. Windows with views to nature.
4. Sitting or perching walls that accommodate more people and avoid clutter.
5. Outdoor rooms of grass (even if synthetic) and wildflowers (low maintenance) to enhance well-being.

Outdoor and environmental considerations need to be embedded in teacher education to ensure they remain on the ‘radar’ during educational discourse.

Access to external spaces and resources expands the range of active learning opportunities available to stimulate imagination and the development of social and motor coordination skills. Therefore, the connectivity between indoor and outdoor learning spaces should be fluid and conducive to exploration and activities in small or large groups.

Complementary indoor and outdoor learning environments diversify in the range of resources that students can use to demonstrate play-based learning, team work, social networking, authentic inquiry and physical fitness.

Teachers, students and support personnel have ready access to a variety of resources so that students can demonstrate learning in different ways.

**Uptake of notions of moving into learning spaces by the education professions**

Organisational impediments need to be addressed if the desired teaching and learning strategies are to be embedded across a school. Ongoing transfer of information and communication of changes in practice will be required. A timeline for change (in years) should be established.

In order to facilitate appropriate flexible designs and enable the new spaces to operate to maximum capacity, the processes that ensure appropriate consultation occurs, and the learnings that the RCH community requires, will need to be understood and followed.

Roles and responsibilities will have to be assigned to leadership groups and teams of staff members at appropriate times – before, during and after the shift into the new spaces. It is important to establish appropriate multi-disciplinary clusters as part of new organisational structures.

The designers, policy makers and educators who understand and manage the pedagogical and spatial changes should accept responsibility for communicating strategic initiatives, and report on other cases and progress. Leaders and those involved in facilitating the change process need to be aware of the issues that are surfacing as a result of the changes occurring and how they will work towards a resolution if the need arises. Constant monitoring of, and adjustments to, organisational structures, curricula and technologies will be required.

Changes to and occupation of school learning spaces should be driven by the users in consultation with the designers and be embedded in pedagogy.

DEECD’s *Performance and Development Culture Revised Self Assessment Framework* (Draft, 2009) is relevant for the performance of leaders’ activities that procure learning environments from the macro to the micro. Four elements of the *Framework* are associated with linking pedagogy and space, viz: Induction into a new role, multiple sources of feedback on practice, individual performance and developmental plans aligned to goals, and quality professional learning.

**Stimulating engagement in learning by others**

All educators would like parents to be involved in their children’s education and help with the development of school-based programs, extra-curricular activities and the reinforcement and extension of academic learning at home. The literature offers little on parent involvement in children’s education in a hospital setting, but Tiffany and Young (Cornell University’s Family Life Centre, Ithaca, NY, [http://www.actforyouth.net/documents/prACTice_Aug04.pdf](http://www.actforyouth.net/documents/prACTice_Aug04.pdf)) stated that human service and health care providers want parents to understand the interventions they offer and how to support their children when they access programs. Educators have the same desire.

Tiffany and Young offered some keys to successful parental involvement in education, for example: allow time for parent involvement efforts to take root; develop parent-to-parent peer programs; and
invite parents to young person-centred events. Some suggested events and involvements have been put forward elsewhere in this paper.

The ‘Raising Children Network’ outlines the importance of parental involvement in education (http://raisingchildren.net.au/articles/involving_parents_in_school_and_childcare.html) and found that interaction between teachers and parents helped with the child’s development and wellbeing and the way this happened had a major impact on how parents related to educators and the organisation to which they belonged. To stimulate engagement in learning, educators could tell parents about the aims of their learning setting, ask the parent about their child’s interests and strengths, their expectations of education and the kind of information they feel would support them as parents, and also suggest specific ways they might become involved.

According to Brown (http://www.kidsource.com/kidsource/content2/Involving_parents.html), research has shown that when parents participate in their children's schooling frequently, it: enhances the children’s self-esteem, improves their academic achievement, improves parent-child relationships and helps parents develop positive attitudes towards, and better understanding of the schooling process. Simple tasks can be shared by parents, carers and the child, e.g. watching a DVD together or going on a problem-solving trail looking for visual or physical clues and completing associated tasks set by an educator.

Greenberg (1989) stressed that parents could feel uneasy if their cultural style or socio-economic level differed from those of the teachers. Some parents may not understand the importance of parent involvement as outlined above, or may think they do not have the skills to be able to help. Even parents who are confident and willing to help may hesitate to become involved for fear of overstepping their boundaries. It is therefore the responsibility of teachers and administrators to encourage parents to become involved through non-threatening activities and welcoming physical settings. This would seem particularly important at stressful times when the hospitalisation of a child is involved.

Smith (2001) noted that barriers to communication with and involvement of parents included: educational and spatial jargon (e.g. differentiation, collaboration); the meaning of statistical analyses; lack of understanding of the system (e.g. some parents may be reticent to assert their opinions with professionals); and logistical problems (e.g. lack of transportation or child-care, work or other responsibilities). He believed that when viewed as a promoter and supporter of the child and family, an educator became a valued invited guest and not an adversary.

When developing goals and objectives in a special setting, it is crucial that parents, advocates, and students share their expectations about the student’s future participation in schooling while in care, at school, or in the home. At the same time, it is important for educators to indicate which objectives parents or carers can help teach or reinforce at home. Whether they are in a regular education classroom, self-contained area, home or hospital, the opportunity for the student to participate in ‘typical’ school experiences with peers as much as possible should be an aim.

It is important to identify strategies to ensure that future communications with parents are ongoing and collegial in order to maximise the benefits of the program for the student. Today, ICT facilitates communication, but community users may well need technical assistance. The provision of welcoming, stimulating, hands-on spaces that both young people and parents want to visit is vital. Active participation assumes there are suitable places for this to occur and that the parents and carers are supported.

Cognisant of the transformation occurring in education in the new millennium and aware that it takes more support than putting computers into schools or funding school construction, Microsoft launched an Innovative School Program in 2007 (http://innovativeschoolsonline.com. Accessed 21/5/2010). Following a pilot program in 12 schools from around the world, it developed a 6i tool to help schools systematically reflect on, plan and implement a vision for reform (Fullan, 2007; Elmore, 2004). It was
not prescriptive, but its six processes were designed to assist optimal innovations for local contexts and specific needs. The phases were:

1. Introspection
2. Investigation
3. Inclusion
4. Innovation
5. Implementation, and
6. Insight.

The 6i's tool was based on the belief that effective leaders do not merely disseminate a completed vision and plan to their school community but rather, they “mobilise, listen to and engage a highly talented and motivated constituency of people who contribute to building and enacting the vision” (The 6i Process, p. 8). A focus of the Inclusion phase of change was for leaders to develop strategies for building support for the change through partnerships beyond the school.

Fullan (2007) found that as additional stakeholders become involved, a school’s vision matures and evolves, and this process takes time. As well as engaging teachers in the vision for change, gaining support from parents, community and business partners is considered vital. As well as face-to-face meetings and seminars, online information, sharing through blogs, and teleconferences all contribute to communication. Inclusion means schools take the opportunity to develop collaborative relationships and feedback mechanisms with the larger community and to further develop their vision for change with the help of these partners. http://innovativeschoolonline.com/WhitePapers/6i_inclusion.pdf, Paper 4, p. 9. (Accessed 21.5.2010).

**Thinking Space** is a workshop resource from CABE (Commission for Architecture and the Built Environment, Futurelab and Portsmouth City Council, UK, (www.visionmapper.org.uk/pdfs/download.php?file=thinkng-space.pdf) that supports people who are currently undertaking the redesign, rebuilding or occupation of new spaces. It provides sets of activities, tools and techniques that can be used to facilitate workshops that assist people in the visioning and pre-engagement phase of projects. Apart from activities for practitioners it offers activities that can be undertaken with students and the wider community to involve them in the process. For example:

1. ‘Stakeholders’ consider organisations, institutions, companies or initiatives that have aspects of principles they might identify with. Rank these in order of importance, then consider what a learning space that reflects these principles might look like.
2. Consider developing an image gallery or an online photo management resource where images can be uploaded and comments received about interesting designs or approaches engagingplaces@cabe.org.uk.

Social network analysis (Penuel, Krause and Frank, 2009) can yield a picture of the critical players in transferring expertise within subgroups of a school and its community. Given the dynamic nature of schools strategies will need to be adapted to pressing needs which can include professional development, technological issues and governance structures.

**Effective communication of the learning environment with the community**

According to the Design Council, UK, (2005) community involvement is both the cause and effect of an improved learning environment. Effective communication by educational institutions has the dual responsibility of presenting their programs positively and promoting links with, and understanding
among, parents and other community groups. The needs and perceptions of users and visitors vary, and improved communication has a role to play in understanding and catering for competing priorities.

Both physical and organisational structures influence communication. With the provision of new infrastructure, educators need to consult with students, parents and the wider community. This includes: clearly written information and understandable plans (e.g. axonometric), white and interactive boards on which to post comments, information sessions for users and visitors that display easy-to-read plans and allow time for discussions about pedagogical implications, and electronic notice boards etc which constantly update information about activities and ways people can be involved. Hopefully buildings will have salient features and ‘landmarks’ that make them navigable and signage to cover foreseeable and acceptable movement around the spaces. Plans of spaces that can be transformed into readable geometric forms are vital (The Commission for Architecture and the Built Environments, UK - CABE).

Principals recently involved in new learning spaces were asked at a DEECD symposium for their recommendations for involving the community. They suggested:

- Erect a building bulletin somewhere the community will see it.
- Hold strategic ‘Showcases’ of the new spaces being used.
- Explain to the community about the changes to pedagogies, ICT, team teaching etc in the light of 21st Century teaching and learning requirements.
- Hold morning teas, etc, for parents with a focus question about the new spaces.
- Nominate tour dates for the community.
- Demonstrate how you listen to the students’ and their voices.
- Showcase the products of the students’ engagement.

The term ‘community orientation’ relates to spaces in a school that accommodate both learners and different sections of the community. They can include resource centres and play an important role through the access they provide.

**Evaluation of learning spaces and learning outcomes**

Fisher, an Australian learning spaces expert, writing on the impact of school infrastructure on student outcomes and behaviour for the Australian government’s Department of Education, Employment and Workplace Relations publication, reviewed a range of studies that examined the possible causal linkages between building design and student learning outcomes (http://www.dest.gov.au/sectors/school_education/publications_resources/schooling_issues_digest/schooling_issues_digest_building). He concluded that, in the USA, although rigorous and sound empirical quantitative research had been conducted, more was required to fully validate the findings. In Europe the findings had been more based on qualitative studies. Taken together, the research was indicating that student academic achievement improves with improved building conditions but that new and emerging trends in education settings’ planning and design and their impact on student outcomes and behaviours have yet to be fully evaluated. The study also included: measuring building conditions; student outcomes and behaviour; building conditions (including age of the facilities) and the relationship to student outcomes and behaviour; individual building elements and their relationship to student outcomes and behaviour; and design factors that can influence learning outcomes and behaviour.

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14 Innovative Learning Environments Seminar, Principals and Regional representatives invited by Lynne Sutton, (a senior manager, DEECD) to discuss issues arising out of the occupation of new learning spaces, Melbourne, March 26, 2010
In 2002, Schneider had examined research into similar areas to those explored by Fisher, stating that those involved in school planning and design saw it as an opportunity to enhance outcomes by creating better learning environments. He concluded from his substantial literature search that school facilities affected learning, that a building’s age should not be used as a predictor of impact on performance, that there is a consensus about the positive effects of small school size which seems to be stronger for students in low socio-economic areas, and the size of the class is not necessarily a determinant of learning outcomes. The quality of the research he described ranged from anecdotal to a few larger studies and there were disagreements over methods used.

In a small study, Weinstein (1977) observed the spatial distribution of activity in a junior primary shared space before and after a change in the physical space. Her intention was to test the hypothesis that changes in the physical setting could produce predictable, desirable changes in student behaviour. The activities and locations of students were recorded on a floor plan of the room. Specific behavioural goals were stated and a two-week post spatial change observation showed that in most cases the desired changes were achieved. Her study provided a ‘neat’ method that individual teachers could use to measure small-scale “success” – ie, select one or two desired behaviours and look for their presence before and after the occupation of a new or refurbished space. The behaviours observed could be social, physical or technical skills.

The University of Melbourne’s staff involved in the Smart Green Schools project (2008-2010) have observed small- and large-scale moves into new spaces over three years. Teachers in a school that had undertaken a large scale building program which included ‘schools-within-schools’ and had occupied the new spaces for a semester, were asked about whether they had observed modified student behaviour (28/1/2010):

**Q. How have the students responded to the new context? In interviews students have told us they liked the creativity, collaboration and decision-making.**

**A. There are almost no trouble-makers because the ‘audience’ for kids who want to “play up” has gone thanks to the spatial configurations.**

**A: Student management issues have virtually disappeared within the new buildings.**

**A. The students are now treated and respected as individuals. They are connected to Houses within a Schools Within Schools and seem to be emotionally settled and ready to learn. The relationship between students and teachers is much closer. There is harmony. It is something to do with the students, the teams of teachers and the space.**

**Q. How has student engagement been affected?**

**A. The kids love to hang round the new spaces. They want to stay there during breaks and after school. The handy access to teachers assists this.**

**Q: There seems to be few, if any, space usage rules. Would particular patterns of behaviour being required in spaces change ways of working?**

**A. We have found that if the students feel comfortable in the environment they are in they settle down without rules AND their work ethic improves.**

These anecdotal comments appeared to support research findings.

The current data available from Victoria’s DEECD administered ‘Attitudes to School’ survey in the school have already shown that student engagement for Years 7, 8 and 9 at this school has been

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15 Publications on pedagogies and space written by the ARC Linkage Grant, Smart Green Schools project team include Take 8 and Critical and Creative Thinking (See references).
outstanding in connection with the learning context. All Victorian schools are able to use this measurement tool.

Other ‘raw’ ways of measuring success, again in behavioural terms, would be to check whether there has been a reduction in disruptive behaviour, the number of detentions and suspensions, the number of absences, vandalism, lateness, and other penalties metered out prior to and following the occupation of new spaces.

It is important to ascertain what outcomes can be attributed to new pedagogical practices and learning spaces. Designers (architects and interior) need to be involved in ongoing post-occupancy evaluation – not just the evaluation that occurs shortly after occupation. There will be design elements that have not been successful or need to be altered in some way.

Ongoing systematic pedagogical post-occupancy evaluation in terms of outcomes of student performance is important. It is easier to judge whether improved thermal factors and spatial designs have contributed to wellbeing, attendance etc, than to put a numerical score on improvement, although the latter has been attempted (Schneider et al., 2002). Outcomes for students will need to be measured via existing and specially designed measurement tools. It will be vital to seek expert advice concerning measurement tools that will provide the required pedagogical and environmental data. How and when this occurs, and by whom, will need to be decided during the establishment of the timeline.

Teams of staff members will need to be encouraged to re-evaluate their beliefs as they practice new pedagogies and occupy altered or newly configured and equipped learning spaces. It will be necessary to find appropriate tools to monitor the performance of the users as they undertake the new pedagogies and teaching practices as well as the extent to which the spaces are being used effectively by both teachers and students. Outside expert advice and critical friends can be employed for this important process.

Ways of measuring the performance of spaces in line with department and governmental guidelines, internal and external policies and standards – including environmental sustainability - will be required. This will be either by the use of existing tools, or, if no suitable tools exist, formulation of new methods of evaluation. Further professional development will be required to carry out this process. The British Design Council recommended in 2005 that policy makers need to summarise the lessons of the past for various audiences, for example, architects, designers, construction firms, regional offices, teachers and the wider community.

**Government education policies on the creative use of spaces: the Victorian context**

The issue of creative use of space for learning has been considered by governments. This penultimate section provides a brief overview of policy-relevant activity in the Australian state of Victoria.

The Victorian DEECD has explored and published on the leading practices adopted by schools and teachers in their quest to improve students’ learning outcomes and identify and respond to student learning needs. Their *Pedagogies and Space* publication includes the design of spaces for 21st century learning, appropriate pedagogies, and students’ learning needs.

DEECD’s Leading Schools Fund initiative aimed to transform teaching practice and improve students’ learning outcomes by investing in additional teachers, accessible ICT and learning spaces. In *Transforming the Learning Experience*, the findings of government investment in the Leading Schools Fund initiative were synthesized into eight key variables characterising transformation (in a Transformation and Development matrix), the central element was found to be teaching and learning. It was believed that a strong focus on all the variables was essential for schools to achieve sustainable whole school transformation and evidence of innovative and student-centred learning.


The federal government through the Curriculum Corporation released its *Learning Spaces Framework: Learning in an Online World* in 2008. The framework was designed to guide high-level strategic decision-making in jurisdictions and schools. It provided advice on key issues to consider when planning new schools, refurbishing or repurposing physical and virtual learning spaces.

**Conclusion**

Aligning the concept of built pedagogy (Monahan, 2002) with contemporarily accepted educational theory for the creation of modern learning environments can support young people to become better prepared for the ever-changing global society of the 21st century. Further aligning these spaces with new forms of spatiality will enhance the likelihood that children and young people will become more engaged as active participants in their own learning and that learning for each individual can become more authentically personalised and equitable.

By making the time to engage in discourse about the spaces in which students learn, and working towards the creation of equitable pedagogical spaces (Cleveland, 2009), schools and educators may be better equipped to cater for the diverse interests and capabilities of the students in their care.

The limitations of this literature review are that, due to its scope, it has incorporated views and evidence from multiple sources, sometimes with little depth while design issues are rooted in particular contexts that need to be expanded to be fully understood. However, it concurs with a literature review commissioned by the Design Council, UK (*The Impact of School Environments*, 2005), that is, that the evidence is unequivocal with regard to the importance of user engagement in defining and solving individualised and local problems in education spaces - the Council (2005, p. 37) concluded that the most successful learning spaces are likely to be those that have within them “elements of flexibility and adaptability for new cohorts of learners and teachers, new curriculum demands and new challenges”.

Whilst this review has also brought together the concepts of personalised learning, flexible, innovative learning spaces with access to technology as a portal in the wider world, it has identified a shortfall of evidence in the international literature that a) embodies these concepts in relation to the occupation of new hospital spaces; b) harnesses the opportunities provided by a new hospital building as a catalyst for the enjoyment and engagement of learning for children and young people; and c) that incorporates the value of creating access and opportunities to parents and health professionals as partners in children’s learning.

The Charter for Children’s Learning at the Royal Children’s Hospital research project will address this gap.
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A Charter for Children’s Learning at The Royal Children’s Hospital

Literature Review
June 2010

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Prepared for and in collaboration with the Royal Children’s Hospital Education Institute
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For more information about the development of the Charter for Children’s Learning at the Royal Children’s Hospital, contact julie.green@rch.org.au
Introduction

This literature review is the first stage in a project to develop an evidence-based Charter for Children’s Learning at the The Royal Children’s Hospital (RCH), Melbourne.

As the leading provider of paediatric health care in Victoria, the RCH is an important site for children who spend vital hours of their lives having their health needs met. Children who experience poor health are at higher risk of lower educational achievement\(^1\). They are more likely to experience academic failure (Needhan, Crosnoe & Muller, 2004), less likely to complete high school (Conley & Bennett, 2000) and less likely to go on to post-secondary education – transitions that are critical to their later occupational attainment, earning ability and quality of life (Haas & Fosse, 2008).

The early years of children’s lives are particularly important to laying the foundations for literacy and for children’s perceptions of themselves as learners. Strong links between health and education during hospitalisation are, therefore, critical to children’s longer term outcomes.

The development of a Charter for Children’s Learning at the RCH is intended to build on the current evidence base and inform a hospital-wide approach to provide children and young people with an alternative and engaging learning site during periods of health care.

A Charter for Children’s Learning at The Royal Children’s Hospital

The Charter project, led by the RCH Education Institute, links the health of children attending the RCH with the development of a sustainable, hospital-wide approach to simultaneously support children’s learning and education during their time at the RCH. It is particularly focused on creating a rich environment for children and young people in the new RCH, due to be opened late 2011.

The development of the Charter is underpinned by contemporary understandings about children’s learning and a philosophy to assist children to engage with hospital-based learning spaces that are complementary to learning at school. The project focuses on children attending the RCH who are in the pre-school, primary- and secondary-school years (3-18 years) and their families.

Children are constant seekers of knowledge from their life situations and are participants in their own development (Shonkoff & Phillips, 2000). It is important that children’s learning stays relevant to their lives and that they engage with alternative learning spaces and places that lie beyond school (Comber, Nixon & Reid, 2007).

While many paediatric hospitals worldwide, including the RCH, have education services that support the maintenance of children’s connection with their schools and school communities, there is no known research that has attempted to develop a Charter for learning or studied a children’s hospital as an alternative learning site that promotes rich, high quality learning environments, hospital-wide.

This literature review provides a platform for the Charter project. It outlines relevant educational theory, practice and policy and highlights the role that effective spaces play in best practice to teaching and learning in schools and out-of-school environments. It examines the literature on successful cultural

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shifts in the adaptation to new learning spaces, including the contribution of the Arts and innovative use of e-learning technologies.

Given the scope of the Charter for children 3-18 years, the review outlines developmental stages of learning for children and young people in this age range and the place that consultation with young people about their learning preferences has in education. The literature review concludes with an overview of Victorian government education policies on the creative use of spaces for learning.

**The relationship between education and learners**

Currently, the institutional relationships between education, curriculum and the learner are being re-examined. Clearer pictures of what pedagogies might constitute in the 21st century are emerging. Central to this is a developing awareness of the need for diverse learning spaces that offer multiple approaches to the acquisition of knowledge skills and more emphasis on learner-learner as well as teacher-learner interactions. The philosophy of a small school established by a far-sighted educator demonstrates how it placed the needs of young people centrally through both place and pedagogy:

> The future belongs to young people who know how to create and participate in learning communities; who know where knowledge is, how to get it, how to think about it and how to use it. They are the ones who will be able to take the greatest advantage of whatever opportunities an unpredictable and rapidly changing world throws their way. The best way to expose students to the Information Age is to place them right in the middle of it.  

Twenty-first century learning models, with their emphasis on collaborative project- and inquiry-based models, together with wireless technologies, have led to what is often described as anywhere, anytime, ubiquitous learning. New partnerships between learners, educators and the community members open up the possibility of learning across institutions, engagement with informal as well as formal learning spaces, different individuals and organisations and the creation of flexible learning communities. This, combined with calls to personalise learning, suggests the need to cater for different learning styles, needs and interests and a greater choice over what, where and how they learn and who they learn with.

Despenza-Green (Director of the National School Initiative, Chicago, in Rudd et al., 2006) stressed that before thinking about the physical, educators need to consider what sort of education they want for their students and check the extent to which their existing physical structures enable it. The OECD's *Schooling for Tomorrow* group\(^3\) believed that immediate contextual dimensions such as partnerships with the community, wide cultural influences and critical factors such as the role of the learner, the organisation and pedagogy are all crucial.

In relation to children’s health and wellbeing, new learning spaces – indoor and outdoor – could have embedded “tactile, sensory and playful learning tools firmly within the design process, thereby creating both very different and non-threatening environments” (Rudd et al., p. 8).

Observation of students’ preferred learning places has led to the provision of new informal learning spaces resembling cafes, lobbies, student union areas, viewing rooms, and library nooks together with multipurpose spaces and classrooms. Given clear teaching and learning aims and appropriate usage, almost any space can be a field for learning.

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\(^2\) PS1 Charter School, Denver, USA set up by Rexford Brown (*Author of Schools of Thought*, 1993) in the late 1990s.

\(^3\) [www.oecd.org/topic/](http://www.oecd.org/topic/)
A brief overview of relevant educational theory, practice and policy

The principles and beliefs of the pedagogical models of constructivism (e.g. Krause et al., 2003), authentic learning (e.g. Newmann & Associates, 1996) together with critical theory (with its foundations in Friere), and Lave and Wenger’s (1991) concept of communities of situated learning are being interwoven with the principles of design and usage of built environments in the 21st century. The elements of interactive, dynamic and creative spaces, visual transparency and appropriate acoustic containment are all viewed as vital components of educational spaces (Featherston4). A shared understanding of appropriate pedagogical practices needs to be in place as educators and students occupy new spaces.

In a learning model called “critical activism” (Hildebrand, 1999) students learn to be actively critical with/in a community. It is this model that the new pedagogies foster and innovative learning spaces support.

Generally, educators who use constructivist approaches favour the inquiry and/or problem based learning models (from Perkins, Paul, Gardner, etc) underpinned by Vygotsky’s belief (1986) that meaningful knowledge is constructed within socio-cultural contexts where shared understandings develop through interactions with others and where the teacher supports or “scaffolds” the students’ learning. It is commonly recognised that people have preferred thinking and learning modes and different attention spans and that learning spaces can provide the environment to foster individual development. Catering for individuals might mean designing spaces for kinaesthetic, auditory, spatial, personal, interpersonal and visual learning (referring back to Howard Gardner’s ‘Intelligences’, 1983 & 1993).

The provision of flexible learning spaces has been found to prompt staff members to form close relationships with their peers and students. Team building and collaborative teaching models lead both teachers and their students to enjoy new teaching and learning models. On occupation of the new spaces, behaviour management issues are said to no longer be an issue. It is believed this is because students feel privileged to belong to specially designed spaces that have eradicated the ‘stage’ for misbehaviour and the new pedagogies are engaging them.

The requirements of state curriculum documents (e.g. Victorian Essential Learning Standards) and national Australian curriculum frameworks need to be understood in the context of the physical environments necessary to support 21st century learning. Based on the findings of the Middle Years Research and Development Project’s findings (MYRAD) (Hill and Russell, 1999), the Principles of Learning and Teaching (P-12) (PoLT) have driven a reflective process in which educators have engaged in conversations about pedagogical practice (Cara, 2009) that can be used to build these understandings.

The Constructivist learning model and new initiatives such as the use of Conceive, Design, Implement, Operate (CDIO - www.cdio.org), along with planning aids such as the Victorian Department of Education and Early Childhood’s e5 Instructional Model (Engage, Explore, Explain, Elaborate, Evaluate) can be used to explore alternatives to traditional curriculum delivery modalities.

The role effective spaces play in connection with best practice teaching and learning

Today, educators are expected to identify the needs of the active, whole learner while expanding their own understanding of built, natural and cultural environments as teaching and learning tools. Hospitals, for example have classrooms, lecture areas, case rooms, u-shaped rooms, multipurpose and seminar

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4 Mary Featherston, designer of school interiors in Victoria, industry partner in the ARC Linkage Project Smart Green Schools (University of Melbourne, 2008-2010).
rooms, break-out areas and recreational facilities. A study of adolescent-friendly recreational facilities (Ries et al., 2008) reminds us that physical activity improves both physical and mental health e.g. attention spans and that usage of recreational facilities is governed by physical, social, organisational and economic factors.

Taylor (2009) believed that once we learn to ‘read’ an environment, we have cultivated what she called the knowing eye. Architect Robert Peters (in Taylor, 2009) described this as a type of visual literacy that enables us to see and critically analyse the physical world and read the environment with deep understanding. Taylor believed that developing the knowing eye meant temporarily suspending the past and opening ourselves to new possibilities.

**What is an effective, innovative learning environment?**

For the purposes of this literature review the definition of an effective leaning space is a setting in which learning takes place as an active process and fosters the capacity of learners to apply knowledge and skills flexibly and creatively in a variety of contexts.

Leaders behind the creation of effective learning environments have a distinctive approach to the ways learners, resources, technologies and facilities inter-relate. Innovative settings together with interdisciplinary and multi-level pedagogical aims, ensure that cognitive, metacognitive and socio-emotional learning needs are catered for.

The emergence of new practices, pedagogies and technologies is questioning what Tyack and Tobin (2004, in Weiss, 2007) called the existing “grammar of schooling” (a set of prescribed social, political and cultural boundaries similar to the rules of grammar in language). The variety of learning spaces and forms of communication, data retrieval and storage, and interaction with people within and beyond the “school”, have challenged the power relations embedded in the architecture that supported teacher-centred learning environments for decades.

Shifting students away from being in rows of desks where only the teacher has the freedom to move, together with the influx of new technologies, constitutes a major change for some educators because their identity, their view of the learner, and their ways of operating are challenged. Many educators will be resistant to change, but by interrogating their existing practices in the light of new learning spaces, educators, nurtured and supported by administrators, can take advantage of the spatial and temporal opportunities offered by new pedagogies and technologies.

Young people with access to technology integrate mobile and computing activities into their daily lives through telephones, email, MySpace and face-book etc. Increasingly, innovative educators are using collaborative and interactive software like wikis and blogs to extend the boundaries of their classroom (Davis, 2006, in Weiss 2007). These innovations allow for access to and from the wider world – announcements, assignments and student work can be posted, giving parents and the community monitored access to the classroom. Flexibly designed pedagogical frameworks and learning spaces that incorporate new networks and technologies are required.

According to CERI, the four elements that constitute the learning process - learners, content, organisation and “teachers” (this includes members of the community, experts, parents, other children and young people) - are always present in a learning context. Those working in learning environments aim for, and hopefully achieve, certain stated outcomes. Some basic categories around which learning could be organised and embedded in a spatial learning context appear below:

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5 This definition is based on content in a report of The Centre for Educational Research and Innovation [CERI] (OECD, 2007).
The Spatial Learning Context – Learning Processes:

- a diversity of pedagogical approaches, teaching styles and expertise
- a mix of loosely and tightly defined curriculum
- catering for a wide ability range including special needs’ learners
- face-to-face and distance learning
- collaborative groupings and individual inquiry
- involvement of experts and community members
- using community spaces and environmental resources
- rich mix of Information Communication Technology and digital resources
- guidance, feedback and outcomes.

(Learning processes and models based on the CERI Report, 2007)

Kalantis and Cope (2005), writing about situated learning, advocated the need for educators to configure and re-configure the various physical and technological resources at hand to create environments that enabled student collaboration and provided opportunities to create meaningful, contextualized work. This included developing “authentic” materials that could exist independently of a classroom and spaces using technologies that enabled students to communicate with the world beyond their learning space. They saw it as important for these elements to be incorporated into both curriculum and pedagogical design.

Until recently, educators have tended to refer to the “environment” in abstract terms, usually psychological states rather than the physical form of the spaces in which they are operating. Professional development has concentrated on improving mood or quality of a learning place, not the physical space per se.

Teacher educators talk about classroom management and atmospheres conducive to learning or encouraging risk-taking. It could be inferred that the belief is that teachers’ skills can overcome physical learning environment deficiencies. Rather than the emphasis being on the teacher, Taylor (2002) believes that “The goal is to encourage the development of learning environments with an overall aesthetic that respects and empowers students, is based on the real world, and reinforces the concepts of hands-on problem solving” (2002, p.28). For example, if the desire is for young people to develop curatorial skills, then assist them to collect and make objects and design settings with display and storage spaces. In this way learning will be related to life. The following example illustrates these characteristics of real-world, hands-on learning:

An educational example

A diverse learning community might comprise a network of educators who seize learning opportunities wherever and whenever they appear. Parents, students, teachers, health professionals etc could work together to design and contribute to fresh and challenging interdisciplinary and differentiated learning experiences for both disadvantaged and able students, maximizing the use of the available spaces and technologies. For example: Internships – linked to with (other) schools, businesses and organizations, Community learning – participation in community projects, Student-taught classes – developing materials to be taught to other learners, and Projects – in collaboration with learners within and outside the learning setting. There could be an emphasis on performance for, and presentation to, various communities (parents and wider) in a range of spaces and the opportunity to attend workshops physically and on line e.g. scientific experiments and

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6 This example is drawn from development of the content of a PS1 Charter School Curriculum Guide, Denver Colorado. (Accessed 2002.) School founder Rexford Brown
historical surveys emanating from places like ‘The Urban/e Science Centre’ centred in the “school”. Projects could include topics like: How Stuff Works, The Power of Travel. Electives could include Sign Language, or Eastern Religious symbols. Running a program like the above could capitalize on the urban community in which the learning centre is situated. Its extended campus could include local art galleries, museums, television stations, parks, zoos, universities, creeks, rivers and pools.

When discussing the built environment Taylor (2009) stated that behind every space structure and item of decoration or furniture there is an idea or concept. People “read” physical objects and spaces and assimilate them. This is design as pedagogy.

Physical elements in the environment can act as visual cues or prompts for learning. This is often described as three-dimensional textbooks or leaning tool. Taylor (2009) described the physical environment as a silent curriculum (p.25) that, although nearly invisible to its users and visitors to the spaces, provided positive or negative learning experiences.

Some may claim that a good teacher can teach anywhere and a willing student can learn anywhere, but this might mean they make do with poor conditions. Taylor believed the powerful effect of the physical learning environment on teaching and learning is overlooked. She quoted her own and other studies that had shown that environments affect achievement and learning outcomes (e.g. Moore and Lackney, 1992; Schneider et al., 2002).

The arrival of the Ultranet into every Victorian school and education centre in 2010 will transform communication and potentially end isolation. It is a protected online environment for users anywhere and anytime that not only provides a learning platform for teaching and learning, but also allows parents to become more involved in their children’s education. Students will be able to communicate and collaborate with other students within their school and across the state and teachers will be able to co-create curricula, collaborate with teachers at other sites, monitor student progress and provide online assessment. Parents will be able to see, among other things, learning tasks, teacher feedback and learning progress.

New technologies can also transform the feel of a space so that it feels safe, quiet and stimulating. Lighting can be activated by sensors, programmed sounds can be fed in, pictures, videos and screens can relay powerful images and text, and new acoustic treatments benefit most rooms used for speech and music.

**Developmental stages of learning for children and young people**

All age groups share the need to belong, have a sense of ownership of learning spaces, experience feelings of familiarity and security, and operate in spaces that facilitate routine while supporting diversity. Young people also need to increasingly be able to experience independence, develop a sense of self, appreciate diversity and build relationships as they move through stages of development. As they move towards the middle years, the need for privacy means that opportunities for young people to ‘retreat’ or ‘escape’ are required without impeding behaviour management. At all ages it is important for them to contribute to, and feel validated by, family and community (Rubida: www.rubida.net).

As the stages of learning and maturity progress (e.g. Piaget (cognitive), Kohlberg (moral) http://www.aggelia.com/htdocs/kohlberg.shtml), the need for flexibility of the space increases until, in the final stages of learning, the environment provides a range of spaces and facilities that respond to individual needs.

The extent of acoustic separation required at all stages is determined by the learning activities’ requirements. The range and quantity of interactive, creative and reflective zones offered also need to

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7 Source: PS1 Curriculum guide.
correspond with age and pedagogies. Stages of learning, relevant to the Charter project, are described below and summarised in Table 1:

**Early years (age 3-8):** Children require spaces that invite and support a strong presence of family and community, enable guided activities, facilitate routine, and offer security and familiarity. Opportunities for retreating, brief interactions and activities, one-to-one withdrawal, constant supervision, and building a sense of ownership and place are required.

Montessori, whose influence on early years’ education has reverberated since the early 1900s, was amazed at how children’s attention could be transfixed by objects in the world around them. Believing that effective learning spaces were those designed to promote exploration and individualised learning, spatial organisation became a key to her educational theory – still influential today.

**Years 3-4 (age 8-10):** Children in this age group are becoming more independent learners and their peer interaction is increasing. Routine, ownership and a space to belong to are still vital, as are family and community presence. Activities, whilst still highly structured, need to offer opportunities for the building of confidence when dealing increasingly with diverse groups of people. One-to-one withdrawal areas are still required, as are areas that allow for conflict resolution. Students are increasingly able to spend quiet time and complete tasks alone. The latter can be viewed as an indicator of behaviour management. A ‘home’ room is vital.

**Years 5-8 (age 10-15):** Children and young people are beginning to connect strongly with their peers and the wider community and interact in an independent manner. There is a strong need to retreat and reflect at times while still needing the security of structure, routine and family presence. While one-on-one work and guided conflict resolution are still required, from this age, students learn to make choices about appropriate behaviour and ways of applying the skills they have developed. Due to the belief that students should belong to the whole space, there may be no fixed space for student belongings. They also begin to interact with a broad range of people in an independent way and understand the wider community.

**Years 9-10 (age 15-16):** Young people have a strong sense of self, are reliant on communication and interaction with peers in a variety of spaces, but also need opportunities for independent work and quiet time. They need withdrawal (small group) and private and communal areas, but do not require a fixed space for their belongings. They interact with a broad range of people including the wider community.

**Senior Secondary years (age 16-18 years):** Young people are beginning to pursue individual pathways and have developed independent working habits although still requiring structure, communal and private spaces and opportunities for peer interaction. Quiet or ‘free’ spaces are important for adolescents for reading, researching, doing homework, or merely ‘escaping’ from others.

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9 Featherston constantly refers to Montessori when describing her own designs.
Table 1 Stages of learning and characteristics of learners

<table>
<thead>
<tr>
<th>Age</th>
<th>Characteristics important to learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early years</td>
<td>Spaces that:</td>
</tr>
<tr>
<td>(age 3-8)</td>
<td>- invite and support a strong presence of family and community</td>
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<tr>
<td></td>
<td>- enable guided activities, facilitate routine, and offer security and familiarity</td>
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<tr>
<td></td>
<td>Opportunities for retreating</td>
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<tr>
<td></td>
<td>Brief interactions and activities</td>
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<tr>
<td></td>
<td>One-to-one withdrawal</td>
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<tr>
<td></td>
<td>Constant supervision</td>
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<tr>
<td></td>
<td>Building a sense of ownership and place</td>
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<tr>
<td>Years 3-4</td>
<td>Growing independence as a learner</td>
</tr>
<tr>
<td>(age 8-10)</td>
<td>Increasing peer interaction</td>
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<tr>
<td></td>
<td>Increasing ability to spend quiet time and complete tasks alone</td>
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<tr>
<td></td>
<td>Family and community presence</td>
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<td></td>
<td>Opportunities for the building of confidence when dealing increasingly with diverse groups of people</td>
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<tr>
<td></td>
<td>Spaces that provide for:</td>
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<tr>
<td></td>
<td>- A sense of ownership and belonging</td>
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<tr>
<td></td>
<td>- One-to-one withdrawal</td>
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<tr>
<td></td>
<td>- Conflict resolution.</td>
</tr>
<tr>
<td></td>
<td>- A ‘home’ room</td>
</tr>
<tr>
<td>Years 5-8</td>
<td>Stronger connection with peers and the wider community</td>
</tr>
<tr>
<td>(age 10-15)</td>
<td>Growing independence and interaction with a broader range of people</td>
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<tr>
<td></td>
<td>Strong need to retreat and reflect at times</td>
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<tr>
<td></td>
<td>Still needing the security of structure and routine and family presence</td>
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<td></td>
<td>Needing one-on-one work and guided conflict resolution</td>
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<tr>
<td></td>
<td>Learning to make choices about appropriate behaviour and ways of applying new skills</td>
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<tr>
<td></td>
<td>Belief that students should belong to the whole space</td>
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<tr>
<td>Years 9-10</td>
<td>Having a strong sense of self</td>
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<tr>
<td>(age 15-16)</td>
<td>Reliant on communication and interaction with peers in a variety of spaces</td>
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<tr>
<td></td>
<td>Spaces and opportunities that:</td>
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<tr>
<td></td>
<td>- facilitate withdrawal (small group) and private and communal areas</td>
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<tr>
<td></td>
<td>- foster independent work and quiet time</td>
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<tr>
<td></td>
<td>Needing to interact with a broad range of people including the wider community</td>
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<tr>
<td>Years 11-12</td>
<td>Beginning to pursue individual pathways</td>
</tr>
<tr>
<td>(age 16-18)</td>
<td>Developed independent working habits although still requiring structure</td>
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<tr>
<td></td>
<td>Spaces and opportunities that:</td>
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<tr>
<td></td>
<td>- are both communal and private</td>
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<tr>
<td></td>
<td>- allow for peer interaction</td>
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<tr>
<td></td>
<td>- are quiet or ‘free’ spaces for reading, researching, or doing homework, or merely ‘escaping’ from others</td>
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</tbody>
</table>

As they mature, students are increasingly willing and able to explore the meaning of space and design and describe their preferred spaces according to personal needs, educational activities and relationships with other people. Back (1998), writing on privacy in hospitals and adolescence, said it is considered important by adolescents, especially those who were frequently admitted, to have some control over such spaces (i.e. not being interrupted or walked in on). Privacy, according to Back, included solitude, anonymity, intimacy and reserve. This knowledge, s/he believed, necessitated researchers to examine the meaning given to space. S/he found that adolescents were not in denial.
about being in hospital for treatment and had incorporated this into their spatial needs without identifying solutions that were excessive or unrealistic.

Consulting children and young people about their preferences

New pedagogical approaches cater for relationships between children and young people of varied ages and stages. What features would spaces that cater for knowledge exchange and mentoring between mixed ages and stages – a scenario that might occur in hospital learning spaces - require? Children and young people could be asked their opinion, a practice that is on the increase in some Australian hospitals through youth advisory councils and consumer representation processes.

The issue of encouraging and including the young person’s voice has been highlighted in the recent findings of The University of Melbourne’s Keeping Connected Australian Research Council and RCH Education Institute funded project (Yates et al., 2010). The 31 young people with health conditions played a central role in producing visual and narrative accounts of the stories they want health and education professionals to hear about their needs and experiences, including their institutional encounters. The study highlights wide-ranging diversity of experiences, needs and views of young people in dealing with their health conditions, and that their voice – as well as that of effective advocates – is an important element in improving outcomes for young people. Further, the Keeping Connected findings underscore the need for hospitals in which young people spend time to acknowledge and support their pursuit of education as a vital part of their overall health and wellbeing.

Lave and Wenger (1991) described how participation in learning is also structured by power relations with the design of learning spaces allowing for certain kinds of participation while excluding others. In order to change the use of space it is necessary to reinvent what the ‘architecture’ of the learning space says about modes of participation. This often causes existing ‘power relations’ to be de-stabilised. Consultation with all potential users, ensuring they participate in discussions about, and trial the use of new spaces, is therefore essential. Part of this process will involve finding ways of ‘making’ people look at spaces and objects in a different way and assisting them to gain insight into the potential of things they see in their everyday life but don’t think about, e.g. the content of a painting or the design of a table. This could be described as developing people’s “Spatial Intelligence” (Gardner, 1983).

Relationships between spatial designers and clients

Taylor (2002) believed that educators should provide architects and the community with an “academic blueprint” as they contemplate new or refurbished education facilities design. This entails certain spatial understandings. Further, she believed that “architects have a reciprocal responsibility to teach the public that the design of physical spaces matters, and that they can be read and translated by our minds into ideas for better understanding of our relationship with the environment” (2002, p. 31).

It is important for designers to understand the new educational pedagogies and produce more innovative learning environments. Educators, students and school community representatives and designers should collaboratively explore how ICT, space and place can impact on or support their pedagogical practices. New builds give clients the opportunity to “reengineer” ICT, space, and place in connection with the pedagogical and operational cultures of schools, departments and other educational units. (See The New Learning Environment: Hybrid Designs for Hybrid Learning www.woodsbagot.com.au/.../ PUBLIC2%20The%20New%20Learning%20Environment.pdf.)

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10 The Royal Children’s Hospital, for example, has its Youth Advisory Council – Y@K – and a commitment to being an adolescent friendly hospital through its Adolescent Model of Care work program.
Designers need to get to the bottom of how and why teachers, other professionals and students currently operate the way they do. This requires consultation, collaboration and “co-construction” of learning environments and time for the various professions to learn each others’ vocabulary.

Nair and Fielding (http://designshare.com/patterns Accessed 30.5.10) believed that educators’ lack of common design vocabulary and graphic pattern language meant that designers needed to be provided with diagrammatic patterns (i.e. rough sketches of big ideas) and illustrative patterns (more detailed sketches). Plans are of little use if they can’t be understood. If health professionals and educators are to interrogate hospital spaces, they could assist designers, by, for example:

1. Naming spatial problems they foresee or have experienced.
2. Describing possible solutions for meeting their stated goals for spaces.
3. Helping the designer address their issues and questions.
4. Understanding that there can be many paths through the design [and occupation] process.

Nair, in 2005 (www.designshare.com/index.php/articles/schools-good-for-children/ accessed 30.5.10) claimed that a building that looks like a “school” may actually be saying a lot that goes beyond its architecture. No one questions that good hospital architecture is about creating effective places for healing, but if the architecture of a children’s hospital aspires to about health and learning, “shouldn’t it support various learning modalities and allow its users to constantly tailor and modify their space to meet changing needs? Shouldn’t it, most of all, be about what children need for their special developmental needs at various stages in their lives?” (Nair, 2005).

Nair raised further relevant points for hospital staff to consider when he discussed good airport architecture. Like airports, hospitals work to get people to their destinations as efficiently as possible while simultaneously attending to their physical, mental, spiritual, and learning needs as they wait or move from one part of the building to the other. Architecture, interior design, furnishings and art works all play an important role here. They can entertain, comfort and educate the users who, in the case of a paediatric hospital community, include children and young people as inpatients and outpatients, parents/guardians, siblings and extended family and others.

Brase (in Rickes, 1997) after inhabiting newly designed spaces that were not satisfactory, was able to say with hindsight that, during the planning stages, the users should have stressed that effective learning space design was critical. Brase sent on to identify that it would have been beneficial if the staff had provided the designers with unambiguous and understandable design objectives that everyone could understand and insisted that the specified criteria were specific enough to be able to hold the designers accountable. Allied with this they realized they should have required follow-up by the designers to ensure that design criteria were met.

The Department of Education and Early Childhood Development has produced excellent publications to support this process (see the section of this paper, ‘Government education policies on the creative use of spaces: the Victorian context).

The contribution of appropriate learning spaces

Spacious, light filled, dynamic and varied learning environments – formal and informal – that support varied learning modes are essential. Meeting places to learn include distributed learning areas, lecture rooms, discussion spaces, retreat areas, information centres, wet areas, projection and storage spaces, stages and mezzanines, discussion pits, counseling spaces, lounge areas, outdoor and eating areas and spaces beyond the education facility. The innovative use of specially designed furniture should accompany each space.
Interaction between staff and young people is enabled by particular spatial arrangements. Exchanges between staff-and-staff and staff-and-students can occur either in public spaces, in rooms where specific tasks are to be carried out, in smaller support spaces, and circulation spaces (e.g. landings on stairways, walls punctuated with lounges and courtyards). New ideas and different approaches come from exchanges and “You can actually feel the way the building acts as an intellectual catalyst” (Wang, in Rickes, 1997, p. 134).

In six newly-constructed hospitals Pati, Harvey and Cason (2008) interviewed staff to ascertain what features of the built environment the users’ (i.e. the health carers) believed supported or impeded different types of flexibility of inpatient medical-surgical units. The staff connected many of their built environment needs with adaptability, i.e. to meet the needs of the patients. Some of the study’s findings and recommendations that emerged from content analysis (Miles & Huberman, 1994) were of relevance to the establishment of learning spaces in similar settings, viz:

- different stakeholders will define flexibility differently and according to their role
- provide storage spaces in work areas and cabinets in rooms and by beds
- create simple layouts to improve visibility – staff-staff and staff-patient
- utilise modular, mobile carts in equipment, medication and dietary rooms
- minimise the electrical and mechanical components of rooms to optimise the potential for space conversion.

**Designing learning spaces: a hospital-specific example**

A group of Harvard University students undertaking a ‘Designing Learning Spaces’ unit under Dan Gilbert (2008)\(^{11}\) explored possibilities for an upgrade of The Lucile Packard Children’s Hospital School (Harvard) due for completion by 2013. Gilbert’s process for a learner-centred approach for designing learning spaces for hospitals but which equally apply elsewhere, comprised:

1. Understanding the learners and other people associated with the spaces.
2. Identifying what activities will be taking place.
3. Brainstorming and generating ideas.
4. Planning and creating: proposing and implementing solutions.
5. Measuring the outcomes.

Gilbert suggested that, in order to understand needs, his students should create young peoples’ ‘personas’ with a variety of health issues and the physical challenges each would represent. They needed to ask: What are their relationships with others like? How does this impact on their school progress? Who are their friends and to what extent do they help them – before and after hospitalisation?

The hospital staff interviewed during this project believed the personas accurately reflected real cases. They added other issues to consider like: adolescents’ reluctance to attend the hospital school because of their appearance and the feeling of isolation when friends stop visiting.

The observation phase of the spaces involved noting current use; interaction between users; attempting to understand the emotional as well as physical needs of the students; and identifying key behaviours and actions of the hospitalised students. Grounded in learning theory and the design process, the students made recommendations for the ways a hospital setting could meet young people’s academic and socio-emotional needs. Although they believed that life was not normal in almost every area of the

\(^{11}\) Site access granted to researcher.
hospital, they advocated the provision of education ‘spaces’ that provided an oasis of normalcy and were respectful of the needs of individuals. First, the students asked themselves what counted as a space. They wanted to limit the extent that medical conditions limited individuals’ achieving to the best of their ability and, following observation and interviews, envisaged three learning spaces connected by a community of learners (Lave & Wenger, 1991): community, bedside learning and virtual learning – described in the footnote 12.

Items for consideration, which the students’ included as ways of assessing the effectiveness of spaces, included:

1. For the community/classroom space – the effectiveness and amount of work completed before and after the new space was used, whether more students were attending, if the space better met teacher needs, and what, if anything was required to augment or change the space to make it most effective.

2. For the “Rolling lap-desk” (the bedside learning) – amount of work completed, changes in study patterns, ease of completing work, the time it took to change the hospital space to a study space, and whether the teachers found it easy to work with.

3. For the virtual space – usage patterns by students and teachers. For students: How many logged on? How much ‘academic’ work was completed? Was there a change in quantity? Were there changes in self-image of any isolated students? For teachers: Ease of use of system and whether the system improved their connection with students.

Supporting innovative use of (e-)learning technologies

Portability and personal ownership of mobile devices increase learning opportunities in a range of spaces. They offer opportunities to capture, access, manipulate and publish information. But, according to Weiss (2007), studies show that currently, even when digital resources are integrated into learning activities, they are largely used for word processing, basic web search and keyboarding and their communicative and collaborative potential as resources is not being realised. Because they have been incorporated into existing classroom spaces in this way they are merely reaffirming the “grammar of schooling”.

12 a. Community space/classrooms. This could be something like a ‘traditional’ separate learning space that students could attend to get away from procedures, parents and nurses. To meet the students’ needs, and the learning goals they had established (ie. normal life, respect for needs, academic achievement) their design contained walk- or wheel-in storage for teachers and students, breakout spaces that allowed privacy, flexible work spaces, power outlets and cabling on floor (cordless where possible), wide walkways, moveable tables with whiteboard tops, colour for inspiration, natural light and indoor-outdoor connection. They designed personalised storage bins for students.

b. Bedside Portable Learning. Alongside IV poles and outlets for various medical devices etc, the students wanted functional learning spaces for those confined to their beds where their medical needs could be forgotten (to the extent this is possible). Although difficult to achieve given Health and Safety issues, they designed a mobile cart for bedside learning that they called a Rolling lap-desk as a possible learning space. It could be folded away, but contained a space for a laptop, a removable storage bin, a hook for a backpack, ‘in’ and ‘out’ folders, a slide out desk, and a slide out white board. They also designed a coloured, lightweight teacher’s bag consisting of slots for ‘in’ and ‘out’ folders and pockets for pens [thumb drives] etc.

c. A Virtual Learning community that united all learners without and outside the hospital environment.

They proposed a virtual school classroom where students, as Avatars, could carry out experiments. Virtually the students could also link up with other students throughout the hospital, the teachers, and the hospital’s community/classroom. The students also suggested a Video streaming capacity that captured the students’ school of origin classroom to enable communication for isolated students to communicate with their school. This capacity or Skype could also link them with home.
By scattering ICT throughout the building, student-centred and directed learning is encouraged. As this paper is written, technologies are changing and innovations are constantly occurring. Today, the minimal requirements for education are a wireless network, laptop computers, phones, an electronic teaching management system and technologies that enable distributed learning – e.g. online, via Skype, video conferencing. Social software is part of students’ daily lives, e.g. blogs, wikis, and bookmarking tools. Such tools lead to shared ownership over information and content. Digital technologies offer the opportunity for flexible, distributed learning providing opportunities for learners to engage with diverse environments and force us to reconsider what learning might look like.

In the UK, Notschool for example, is an online support network of buddies, mentors and experts to support learners in non-formal learning settings (www.notschool.net/ns/template.php). Space Mission fostered new approaches to learning. It enabled learners to work collaboratively in teams using interactive material, video-conferencing and messaging to communicate with one another and remotely located experts (www.futurelab.org.uk/showcase/space_mission).

In an article evaluating radio frequency identification systems (RFIS) in hospitals, Fisher and Monahan (2008) raised relevant issues for the introduction of new education technologies for patients and other personnel and their potential to improve hospital functions. They stressed that the integration of these technologies into hospital practices often results in dramatic changes in management, division of labour, and accountability. They cautioned that the introduction of new technologies must be studied in particular social contexts and their caution can be extrapolated to information technologies associated with teaching and learning in hospital spaces. Their recommendations apply broadly:

First, hospital administrators should craft clear management goals. This includes defining, in advance, the intended goals and functions of the systems, the ways in they fit into the broader management plans of hospitals, and rationales for their use.

Second, the associated responsibilities, including operation, technical assistance, evaluation and training, should be mapped out and negotiated in collaboration with staff members prior to implementation and should be revisited periodically. Anticipating likely increases in workloads and staff surveillance and explicitly negotiating policies with staff will likely engender greater staff support and more successful incorporation of the systems.

Third, the distribution of material resources should be evaluated and planned for well in advance. Administrators and staff should assess the types of technologies and associated spatial resources required and the potential physical constraints such as storage issues.

Fourth, it is critically important that the design of such systems and interfaces are technically functional, intuitive, easy to use, and as complementary as possible to established practices and processes of delivering care at the hospital. Additionally, hospitals should expect that these systems will require ongoing investment in staff positions and technical supplies.

Fifth, the attitudes of the staff should be ascertained and should inform the range of functions for the systems in each hospital setting. It is important to ask how each group of hospital staff perceives the workload associated with the systems, stressing and demonstrating the advantages and the utility of the RFID systems for patient care and wellbeing.

Technologies must be understood within their social contexts and not as external forces applied discretely to social problems.

When thinking about the role technologies can play in both public and private arenas, a field that is receiving increased attention from scholars interested in communications theory is ‘Entertainment-
Education’ (EE). Defined by Singhal and Everett (2002, p.117) as the intentional placement of educational content into ‘entertaining’ media messages, it is an intervention strategy that can be used to disseminate ideas through entertaining media sources that bring about behavioural and social change. Today, the power of media like movies, television, music, spectator sports, newspapers, phones, advertisements and internet to influence emotions and actions, is not questioned.

Like the above, contrived EE interventions are believed capable of modelling self-efficacy – where an individual’s capacity to deal with or have control over a situation is modeled (e.g. eating the right foods to lose weight and be healthy). Interventions are also believed capable of modelling desired behaviours like taking medication or applying sunscreen. Lieberman (2001) found a positive effect of an EE game called ‘Click Health’ which was designed to assist children to live with diabetes. Singhal and Everett (2002) also reported that research has shown that EE interventions evoke interpersonal communication between the audience, friends and relatives. EE supporters believe that emotion has the power to trigger preventable poor health behaviours (e.g. showing how a health event brought on by some kind of abuse affects a family). Such examples of EE interventions require careful aims, planning, and skillful management.

Those interested in Entertainment Education are social learning, social construction and social cognition theorists and also people interested in achieving audience involvement. The internet can always be part of EE, but it is important to remember that the less educated, poor and rural populations may have little access to it. As well, resistance to EE may come from those who view it as a ‘big brother’ intervention. To maximise acceptance, coherent, pleasurable and entertaining narratives, not too heavy-handed about the educational message, are advisable.

**Successful cultural shifts in the use of learning spaces – The future**

The emergence of digital technologies, the role of education viewed as lifelong learning, and the push to see the role of schools as resources for the community are setting up radical notions of ‘the school’. Heppell et al. at Ultralab (rubble.heppell.net/places/media/final_report.pdf) outlined four possible future scenarios that exemplified possible educational futures where educational visions included individualised, community-based and vocational approaches, where diverse uses of technology increased connectivity and delivery, and diverse learning included situated, remote and collaborative learning practices. Ultralab posed four radical directions to ponder:

1. Learners based at home, learning from experts anywhere in the world.
2. Secondary schools operating like a university with faculties each offering an area of expertise.
3. Time is spent on a campus but learning takes place whenever and wherever it is needed.
4. A school where at all times the business of formal learning was carried out with no distractions.

Alternative education visions that cause us to rethink our educational assumptions and practices include:

- ‘Classes’ contain students of any age.
- Spaces in which learners feel comfortable.
- More teachers working collaboratively in spaces.
- Spaces designed to maximise learner control of resources.
- Time and space boundaries are flexible.

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13 Similarly, personal response systems, or “clicker” technology, are devices that allow instructors to get a quick pulse on what students understand and what topics might need further review. They are also ways to inject some active engagement into the normally passive environment and could be used in a hospital setting.
- School is not compulsory.
- Online experts act as mentors.
- Most learning involves problem-solving and collaboration.
- Informal learning is valued as much as formal learning.
- Learning spaces foster relationships between people of all ages.
- There is greater community and culturally-based learning and information exchange.
- The curriculum is organized around spaces rather than subjects.
- Learning spaces are part of ‘hubs’ enabling diversity of people, resources and community input.

Ultralab also proposed **future scenarios** that offer models of “ubiquitous, ambient and persuasive technologies” that can be created anywhere and cater for differentiated learning and individual learners:

1. **Personalised pods** where learners have their own work space with apt tools and technologies to assist their writing, researching, publishing and communicating.
2. **Workflow areas** that are zoned around types of activities – e.g. for research, ideas development, production and presentation.
3. **Learning landscapes** where individuals place media files containing images, text and audio-based ‘livelinks’ that play on personal devices of passers-by (by pointing their portable devices at objects in the environment). The information could include local knowledge, local history, and personal narratives.
4. **Touch screens** that are also work surfaces, fully-interactive and linked with personal devices and function as screens for video-conferencing with others.
5. **Disused space – new place** that can be quickly re-organised and linked to the local community through wireless networks to promote a sense of community development and awareness of local environmental issues.
6. **Mobile production hubs** – ‘vans’ with wireless connection and inbuilt digital production and editing suites are parked in available spaces.
7. **Augmented reality** merges real and computer-generated worlds.
8. **Virtual reality** enables users to interact in computer-simulated and immersive environments.
9. **Transporta-cabin** – an experimental experiential mobile (within a designated area) cabin serves as a showcase and a sanctuary for learners. Its focus is to transport the learner enabling them to escape and simulate environments not normally accessible and stimulate the senses.

(Paraphrased from *what if…?* Rudd, Clifford, Morrison and Facer – Futurelab, 2006)

**The contribution of the Arts in health care – some suggested models**

Gund and Dorsten (in Rickes, 1997) saw art as part of, not outside, intellectual and creative life and part of the mainstream of education. They believed that leaders could provide a vision for the place of the arts in their institution and this in turn would influence spatial design.

Gary Chard (2003), Director of the **Awesome International Children’s Arts Festival** (in Western Australia) is dedicated to introducing young people to a range of contemporary arts experiences that aim to enhance, promote and celebrate their individuality, expand their arts language and introduce them to the process of making works of art that communicate messages about their worlds. He described **Artshed**, a space that focussed on engaging young people. In it, contemporary artists worked in different mediums over 14 days in what they called an arts factory. Young people visit the space regularly [and repeatedly] as the projects developed, talked to the artists, found out about the processes and learned more about the arts community. He believed this model helped to overcome artists’ reluctance to spend time working with young people. Chard’s aim was to attract young people to visit and engage because they want to, but realised that because adults usually acted as gatekeepers, the
program needed to attract both audiences. ‘Awesome’s’ work with students centred on their own way of expressing themselves.

A project of the City of Melbourne, *ArtPlay*, where children and artists had the opportunity to get together and imagine, explore and create art offers another model that could be taken up elsewhere. *Eco-Cubby*, part of this project, offered an opportunity for young people to meet with architects to workshop how a practical and build-able design would consider function, shelter, materials and resources.

Jane Vytrhlik (2003), of the Powerhouse Museum, Sydney, saw the museum’s hallmarks as interactivity and integration and showing the influence of human creativity in the sciences and the arts. She saw the museum’s role as emphasising the lifelong importance of ‘the real’. The high-tech and design-based museum is increasingly mounting exhibitions with children’s interactive activities, even though they are ‘messy’. She explored the reasons why the Star Wars exhibition was their most successful. The museum allotted visually attractive, dedicated ‘safe’, free space within the museum for 6 weeks. It catered for different ages, and the content linked to the exhibition’s content. The content created the inspiration for the children and parents to talk and they could take away the products they made. Vytrhlik believed that the museum staff needed to teach parents as well as teachers how to use the museum.

The *Light in Winter*, Melbourne’s Federation Square’s annual winter program celebrating the importance of ‘light’ in our multicultural community, offers another model for involvement in the arts that is not classroom-centric. In 2010, a large-scale major work by world-renowned artist Raphael Lozano-Hemmer was exhibited in the square. An associated education program was designed to support themes of ‘cultural origins’ and ‘light’ through student engagement in tour-based activities. The program began at an Indigenous campfire installation around which experienced Indigenous educators engaged students in activities such as traditional stories of the area around Melbourne, traditional music and dance. A facilitated tour of ‘Light in Winter’ artistic installations then led students around Fed Square. Activities included didjeridu playing, storytelling, Indigenous history, the story of Melbourne, Indigenous dance, and Dreamtime storytelling. Online activities and resources were provided to visitors prior to and following each tour.

A hospital-specific take on the National Gallery of Victoria’s *Artie Mouse* could take families on a tour of the hospital’s spaces and artifacts. Parents could participate in creative adventures that reveal hidden treasures, and an opportunity to express themselves in a workshop could follow, e.g. making cut-out or constructed art pieces or sculptures, performing on stage, painting faces or decorating bodies in a ‘body art studio’ (http://www.ngv.vic.gov.au/). A web page offering virtual travel and visual artworks could be created. Photos with descriptions of what can be discovered in different places around the world could be posted. (See www.art-mouse.com/)

All the models described above could be adopted and incorporated in or as learning spaces elsewhere.

**Learning in out-of-school environments**

Both Howard Gardner (theorist) and Mary Featherston (designer) believe that a good museum provides a great model for education because of its interactive, self-directed, inquiry- and problem-based learning opportunities that focus on ‘real’ things that remain at the core of the learning experience. Lord and May (in Rickes, 1997) believed museum pieces help people understand the world around them and can be used for display, study, or the education of the viewer. They recommended that institutions re-examine their historical and cultural assets and prepare a clear vision of the role of its artifacts.

For example, significant artworks may be in secluded places, historical apparatus, photographs and other memorabilia could be in storerooms. Rather than just being displayed, an instructive program that explains the objects could be put in place so that the collection becomes an interactive and living
educational force. This might include open storage, study nooks and multi-media or on-line databases and activities. Many of the staff will be unlikely to be familiar with using objects as tools of inquiry and will need opportunities to think about ways of creating opportunities for patients and visitors to interact with the “collection”. In this way the hospital becomes a place of inquiry. Temporary displays or lectures on aspects of the collection will involve the community. An out-of-school example follows:

The Kenyon College Book Shop in Gambia, Ohio, USA, provided a spatial model that could be established within a hospital. It found that when it used stuffed grizzly bears, tents and canoe paddles to promote its camping section, children crawled into the tents to read books and used the stuffed bears as couches. Away from quiet areas it had a lounge area with couches and large windows that looked over a garden area, a newsstand, café, and convenience store. They found it had become an intellectual community centre where students wrote essays or played chess. This space is not unique – there are many similar spaces in the community today. They are both profitable businesses and intellectual and social successes. They are places where staff and students can read, eat, talk, relax, listen to music, and mix. Such places in institutions associated with young people bristle with activity and tolerate the “boisterous irreverence” of the students (Finefroack, in Rickes, 1997, p. 105).

The outdoor environment

Apart from offering shelter when needed, the design of outdoor facilities can support the needs of all students through the provision of equipment and resources that meet social, recreational, learning, fitness, and quiet reflection requirements.

The landscape is the first thing people see when entering an institution. If guidelines and standards for the best arrangement of spaces, circulation, and plantings keep in mind the institution’s mission and history, it can provide a serene and sensory experience. It can also augment the institution’s educational program as well as providing positive visual memories for its occupants and visitors.

If students are to be consulted about the landscape, then asking them questions about their environment that they can comprehend are essential. Evans et al. (2007) found that the children in their study of students’ environmental attitudes found they had strong pro-environmental attitudes but not necessarily behaviors that were consistent. The researchers’ methods of obtaining attitudes were interesting. They designed a felt board on which children displayed scenarios, they created a board game with either/or choices and they had a worry thermometer on which levels of concern could be recorded.

Outdoor areas need to be well maintained, feel safe, and enable a range of activities. In a hospital environment, outdoor areas that resemble a park, could, for example have built-in games or clues to puzzles they have been asked to solve. Obviously ramps, paths and access must accommodate wheel chairs etc and hard surfaces may be required for this. Faber and Kuo (2008) when describing how ‘nature’ improved concentration levels of children with ADHD identified helpful features that could be integrated into indoor and outdoor spaces:

1. Accessible natural amenities like trees, flowers, open lawn, small bushes [and vegetables].
2. Natural amenities like aquariums, terrariums and indoor plants.
3. Windows with views to nature.
4. Sitting or perching walls that accommodate more people and avoid clutter.
5. Outdoor rooms of grass (even if synthetic) and wildflowers (low maintenance) to enhance well-being.

Outdoor and environmental considerations need to be embedded in teacher education to ensure they remain on the ‘radar’ during educational discourse.

Access to external spaces and resources expands the range of active learning opportunities available to stimulate imagination and the development of social and motor coordination skills. Therefore, the connectivity between indoor and outdoor learning spaces should be fluid and conducive to exploration and activities in small or large groups.

Complementary indoor and outdoor learning environments diversify in the range of resources that students can use to demonstrate play-based learning, team work, social networking, authentic inquiry and physical fitness.

Teachers, students and support personnel have ready access to a variety of resources so that students can demonstrate learning in different ways.

Uptake of notions of moving into learning spaces by the education professions

Organisational impediments need to be addressed if the desired teaching and learning strategies are to be embedded across a school. Ongoing transfer of information and communication of changes in practice will be required. A timeline for change (in years) should be established.

In order to facilitate appropriate flexible designs and enable the new spaces to operate to maximum capacity, the processes that ensure appropriate consultation occurs, and the learnings that the RCH community requires, will need to be understood and followed.

Roles and responsibilities will have to be assigned to leadership groups and teams of staff members at appropriate times – before, during and after the shift into the new spaces. It is important to establish appropriate multi-disciplinary clusters as part of new organisational structures.

The designers, policy makers and educators who understand and manage the pedagogical and spatial changes should accept responsibility for communicating strategic initiatives, and report on other cases and progress. Leaders and those involved in facilitating the change process need to be aware of the issues that are surfacing as a result of the changes occurring and how they will work towards a resolution if the need arises. Constant monitoring of, and adjustments to, organisational structures, curricula and technologies will be required.

Changes to and occupation of school learning spaces should be driven by the users in consultation with the designers and be embedded in pedagogy.

DEECD’s Performance and Development Culture Revised Self Assessment Framework (Draft, 2009) is relevant for the performance of leaders’ activities that procure learning environments from the macro to the micro. Four elements of the Framework are associated with linking pedagogy and space, viz: Induction into a new role, multiple sources of feedback on practice, individual performance and developmental plans aligned to goals, and quality professional learning.

Stimulating engagement in learning by others

All educators would like parents to be involved in their children’s education and help with the development of school-based programs, extra-curricular activities and the reinforcement and extension of academic learning at home. The literature offers little on parent involvement in children’s education in a hospital setting, but Tiffany and Young (Cornell University’s Family Life Centre, Ithaca, NY, http://www.actforyouth.net/documents/prACTice_Aug04.pdf) stated that human service and health care providers want parents to understand the interventions they offer and how to support their children when they access programs. Educators have the same desire.

Tiffany and Young offered some keys to successful parental involvement in education, for example: allow time for parent involvement efforts to take root; develop parent-to-parent peer programs; and
invite parents to young person-centred events. Some suggested events and involvements have been put forward elsewhere in this paper.

The ‘Raising Children Network’ outlines the importance of parental involvement in education (http://raisingchildren.net.au/articles/involving_parents_in_school_and_childcare.html) and found that interaction between teachers and parents helped with the child’s development and wellbeing and the way this happened had a major impact on how parents related to educators and the organisation to which they belonged. To stimulate engagement in learning, educators could tell parents about the aims of their learning setting, ask the parent about their child’s interests and strengths, their expectations of education and the kind of information they feel would support them as parents, and also suggest specific ways they might become involved.

According to Brown (http://www.kidsource.com/kidsource/content2/Involving_parents.html), research has shown that when parents participate in their children's schooling frequently, it: enhances the children's self-esteem, improves their academic achievement, improves parent-child relationships and helps parents develop positive attitudes towards, and better understanding of the schooling process. Simple tasks can be shared by parents, carers and the child, e.g. watching a DVD together or going on a problem-solving trail looking for visual or physical clues and completing associated tasks set by an educator.

Greenberg (1989) stressed that parents could feel uneasy if their cultural style or socio-economic level differed from those of the teachers. Some parents may not understand the importance of parent involvement as outlined above, or may think they do not have the skills to be able to help. Even parents who are confident and willing to help may hesitate to become involved for fear of overstepping their boundaries. It is therefore the responsibility of teachers and administrators to encourage parents to become involved through non-threatening activities and welcoming physical settings. This would seem particularly important at stressful times when the hospitalisation of a child is involved.

Smith (2001) noted that barriers to communication with and involvement of parents included: educational and spatial jargon (e.g. differentiation, collaboration); the meaning of statistical analyses; lack of understanding of the system (e.g. some parents may be reticent to assert their opinions with professionals); and logistical problems (e.g. lack of transportation or child-care, work or other responsibilities). He believed that when viewed as a promoter and supporter of the child and family, an educator became a valued invited guest and not an adversary.

When developing goals and objectives in a special setting, it is crucial that parents, advocates, and students share their expectations about the student's future participation in schooling while in care, at school, or in the home. At the same time, it is important for educators to indicate which objectives parents or carers can help teach or reinforce at home. Whether they are in a regular education classroom, self-contained area, home or hospital, the opportunity for the student to participate in 'typical' school experiences with peers as much as possible should be an aim.

It is important to identify strategies to ensure that future communications with parents are ongoing and collegial in order to maximise the benefits of the program for the student. Today, ICT facilitates communication, but community users may well need technical assistance. The provision of welcoming, stimulating, hands-on spaces that both young people and parents want to visit is vital. Active participation assumes there are suitable places for this to occur and that the parents and carers are supported.

Cognisant of the transformation occurring in education in the new millennium and aware that it takes more support than putting computers into schools or funding school construction, Microsoft launched an Innovative School Program in 2007 (http://innovativeschoolsonline.com. Accessed 21/5/2010). Following a pilot program in 12 schools from around the world, it developed a 6i tool to help schools systematically reflect on, plan and implement a vision for reform (Fullan, 2007; Elmore, 2004). It was
not prescriptive, but its six processes were designed to assist optimal innovations for local contexts and specific needs. The phases were:

1. Introspection
2. Investigation
3. Inclusion
4. Innovation
5. Implementation, and
6. Insight.

The 6is tool was based on the belief that effective leaders do not merely disseminate a completed vision and plan to their school community but rather, they “mobilise, listen to and engage a highly talented and motivated constituency of people who contribute to building and enacting the vision” (The 6i Process, p. 8). A focus of the Inclusion phase of change was for leaders to develop strategies for building support for the change through partnerships beyond the school.

Fullan (2007) found that as additional stakeholders become involved, a school’s vision matures and evolves, and this process takes time. As well as engaging teachers in the vision for change, gaining support from parents, community and business partners is considered vital. As well as face-to-face meetings and seminars, online information, sharing through blogs, and teleconferences all contribute to communication. Inclusion means schools take the opportunity to develop collaborative relationships and feedback mechanisms with the larger community and to further develop their vision for change with the help of these partners. http://innovativeschoolsonline.com/WhitePapers/6i_inclusion.pdf, Paper 4, p. 9. (Accessed 21.5.2010).

Thinking Space is a workshop resource from CABE (Commission for Architecture and the Built Environment, Futurelab and Portsmouth City Council, UK, (www.visionmapper.org.uk/pdfs/download.php?file=thinkng-space.pdf) that supports people who are currently undertaking the redesign, rebuilding or occupation of new spaces. It provides sets of activities, tools and techniques that can be used to facilitate workshops that assist people in the visioning and pre-engagement phase of projects. Apart from activities for practitioners it offers activities that can be undertaken with students and the wider community to involve them in the process. For example:

1. ‘Stakeholders’ consider organisations, institutions, companies or initiatives that have aspects of principles they might identify with. Rank these in order of importance, then consider what a learning space that reflects these principles might look like.
2. Consider developing an image gallery or an online photo management resource where images can be uploaded and comments received about interesting designs or approaches engagingplaces@cabe.org.uk.

Social network analysis (Penuel, Krause and Frank, 2009) can yield a picture of the critical players in transferring expertise within subgroups of a school and its community. Given the dynamic nature of schools strategies will need to be adapted to pressing needs which can include professional development, technological issues and governance structures.

Effective communication of the learning environment with the community

According to the Design Council, UK, (2005) community involvement is both the cause and effect of an improved learning environment. Effective communication by educational institutions has the dual responsibility of presenting their programs positively and promoting links with, and understanding
among, parents and other community groups. The needs and perceptions of users and visitors vary, and improved communication has a role to play in understanding and catering for competing priorities.

Both physical and organisational structures influence communication. With the provision of new infrastructure, educators need to consult with students, parents and the wider community. This includes: clearly written information and understandable plans (e.g. axonometric), white and interactive boards on which to post comments, information sessions for users and visitors that display easy-to-read plans and allow time for discussions about pedagogical implications, and electronic notice boards etc which constantly update information about activities and ways people can be involved. Hopefully buildings will have salient features and ‘landmarks’ that make them navigable and signage to cover foreseeable and acceptable movement around the spaces. Plans of spaces that can be transformed into readable geometric forms are vital (The Commission for Architecture and the Built Environments, UK - CABE).

Principals recently involved in new learning spaces were asked at a DEECD symposium\(^{14}\) for their recommendations for involving the community. They suggested:

- Erect a building bulletin somewhere the community will see it.
- Hold strategic ‘Showcases’ of the new spaces being used.
- Explain to the community about the changes to pedagogies, ICT, team teaching etc in the light of 21\(^{st}\) Century teaching and learning requirements.
- Hold morning teas, etc, for parents with a focus question about the new spaces.
- Nominate tour dates for the community.
- Demonstrate how you listen to the students’ and their voices.
- Showcase the products of the students’ engagement.

The term ‘community orientation’ relates to spaces in a school that accommodate both learners and different sections of the community. They can include resource centres and play an important role through the access they provide.

**Evaluation of learning spaces and learning outcomes**

Fisher, an Australian learning spaces expert, writing on the impact of school infrastructure on student outcomes and behaviour for the Australian government’s Department of Education, Employment and Workplace Relations publication, reviewed a range of studies that examined the possible causal linkages between building design and student learning outcomes (http://www.dest.gov.au/sectors/school_education/publications_resources/schooling_issues_digest/schooling_issues_digest_building). He concluded that, in the USA, although rigorous and sound empirical quantitative research had been conducted, more was required to fully validate the findings. In Europe the findings had been more based on qualitative studies. Taken together, the research was indicating that student academic achievement improves with improved building conditions but that new and emerging trends in education settings’ planning and design and their impact on student outcomes and behaviours have yet to be fully evaluated. The study also included: measuring building conditions; student outcomes and behaviour; building conditions (including age of the facilities) and the relationship to student outcomes and behaviour; individual building elements and their relationship to student outcomes and behaviour; and design factors that can influence learning outcomes and behaviour.

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\(^{14}\) Innovative Learning Environments Seminar, Principals and Regional representatives invited by Lynne Sutton, (a senior manager, DEECD) to discuss issues arising out of the occupation of new learning spaces, Melbourne, March 26, 2010
In 2002, Schneider had examined research into similar areas to those explored by Fisher, stating that those involved in school planning and design saw it as an opportunity to enhance outcomes by creating better learning environments. He concluded from his substantial literature search that school facilities affected learning, that a building’s age should not be used as a predictor of impact on performance, that there is a consensus about the positive effects of small school size which seems to be stronger for students in low socio-economic areas, and the size of the class is not necessarily a determinant of learning outcomes. The quality of the research he described ranged from anecdotal to a few larger studies and there were disagreements over methods used.

In a small study, Weinstein (1977) observed the spatial distribution of activity in a junior primary shared space before and after a change in the physical space. Her intention was to test the hypothesis that changes in the physical setting could produce predictable, desirable changes in student behaviour. The activities and locations of students were recorded on a floor plan of the room. Specific behavioural goals were stated and a two-week post spatial change observation showed that in most cases the desired changes were achieved. Her study provided a ‘neat’ method that individual teachers could use to measure small-scale “success” – ie, select one or two desired behaviours and look for their presence before and after the occupation of a new or refurbished space. The behaviours observed could be social, physical or technical skills.

The University of Melbourne’s staff involved in the Smart Green Schools project (2008-2010) have observed small- and large-scale moves into new spaces over three years. Teachers in a school that had undertaken a large scale building program which included ‘schools-within-schools’ and had occupied the new spaces for a semester, were asked about whether they had observed modified student behaviour (28/1/2010):

Q. How have the students responded to the new context? In interviews students have told us they liked the creativity, collaboration and decision-making.

A. There are almost no trouble-makers because the ‘audience’ for kids who want to “play up” has gone thanks to the spatial configurations.

A: Student management issues have virtually disappeared within the new buildings.

A. The students are now treated and respected as individuals. They are connected to Houses within a Schools Within Schools and seem to be emotionally settled and ready to learn. The relationship between students and teachers is much closer. There is harmony. It is something to do with the students, the teams of teachers and the space.

Q. How has student engagement been affected?

A. The kids love to hang round the new spaces. They want to stay there during breaks and after school. The handy access to teachers assists this.

Q: There seems to be few, if any, space usage rules. Would particular patterns of behaviour being required in spaces change ways of working?

A. We have found that if the students feel comfortable in the environment they are in they settle down without rules AND their work ethic improves.

These anecdotal comments appeared to support research findings.

The current data available from Victoria’s DEECD administered ‘Attitudes to School’ survey in the school have already shown that student engagement for Years 7, 8 and 9 at this school has been

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15 Publications on pedagogies and space written by the ARC Linkage Grant, Smart Green Schools project team include Take 8 and Critical and Creative Thinking (See references).
outstanding in connection with the learning context. All Victorian schools are able to use this measurement tool.

Other ‘raw’ ways of measuring success, again in behavioural terms, would be to check whether there has been a reduction in disruptive behaviour, the number of detentions and suspensions, the number of absences, vandalism, lateness, and other penalties metered out prior to and following the occupation of new spaces.

It is important to ascertain what outcomes can be attributed to new pedagogical practices and learning spaces. Designers (architects and interior) need to be involved in ongoing post-occupancy evaluation – not just the evaluation that occurs shortly after occupation. There will be design elements that have not been successful or need to be altered in some way.

Ongoing systematic pedagogical post-occupancy evaluation in terms of outcomes of student performance is important. It is easier to judge whether improved thermal factors and spatial designs have contributed to wellbeing, attendance etc, than to put a numerical score on improvement, although the latter has been attempted (Schneider et al., 2002). Outcomes for students will need to be measured via existing and specially designed measurement tools. It will be vital to seek expert advice concerning measurement tools that will provide the required pedagogical and environmental data. How and when this occurs, and by whom, will need to be decided during the establishment of the timeline.

Teams of staff members will need to be encouraged to re-evaluate their beliefs as they practice new pedagogies and occupy altered or newly configured and equipped learning spaces. It will be necessary to find appropriate tools to monitor the performance of the users as they undertake the new pedagogies and teaching practices as well as the extent to which the spaces are being used effectively by both teachers and students. Outside expert advice and critical friends can be employed for this important process.

Ways of measuring the performance of spaces in line with department and governmental guidelines, internal and external policies and standards – including environmental sustainability - will be required. This will be either by the use of existing tools, or, if no suitable tools exist, formulation of new methods of evaluation. Further professional development will be required to carry out this process. The British Design Council recommended in 2005 that policy makers need to summarise the lessons of the past for various audiences, for example, architects, designers, construction firms, regional offices, teachers and the wider community.

**Government education policies on the creative use of spaces: the Victorian context**

The issue of creative use of space for learning has been considered by governments. This penultimate section provides a brief overview of policy-relevant activity in the Australian state of Victoria.

The Victorian DEECD has explored and published on the leading practices adopted by schools and teachers in their quest to improve students’ learning outcomes and identify and respond to student learning needs. Their *Pedagogies and Space* publication includes the design of spaces for 21st century learning, appropriate pedagogies, and students’ learning needs.

DEECD’s Leading Schools Fund initiative aimed to transform teaching practice and improve students’ learning outcomes by investing in additional teachers, accessible ICT and learning spaces. In *Transforming the Learning Experience*, the findings of government investment in the Leading Schools Fund initiative were synthesized into eight key variables characterising transformation (in a Transformation and Development matrix), the central element was found to be teaching and learning. It was believed that a strong focus on all the variables was essential for schools to achieve sustainable whole school transformation and evidence of innovative and student-centred learning.

Transforming Pedagogy in the 21\textsuperscript{st} Century: Be THE REVOLUTION (2009) was a resource prepared by the Southern Metropolitan Regeneration Coaches to support principals with their moves into new learning spaces. It also contained many other relevant references. [http://www.smr.vic.edu.au/betherevolution/](http://www.smr.vic.edu.au/betherevolution/)

The federal government through the Curriculum Corporation released its *Learning Spaces Framework: Learning in an Online World* in 2008. The framework was designed to guide high-level strategic decision-making in jurisdictions and schools. It provided advice on key issues to consider when planning new schools, refurbishing or repurposing physical and virtual learning spaces.

**Conclusion**

Aligning the concept of built pedagogy (Monahan, 2002) with contemporarily accepted educational theory for the creation of modern learning environments can support young people to become better prepared for the ever-changing global society of the 21\textsuperscript{st} century. Further aligning these spaces with new forms of spatiality will enhance the likelihood that children and young people will become more engaged as active participants in their own learning and that learning for each individual can become more authentically personalised and equitable.

By making the time to engage in discourse about the spaces in which students learn, and working towards the creation of equitable pedagogical spaces (Cleveland, 2009), schools and educators may be better equipped to cater for the diverse interests and capabilities of the students in their care.

The limitations of this literature review are that, due to its scope, it has incorporated views and evidence from multiple sources, sometimes with little depth while design issues are rooted in particular contexts that need to be expanded to be fully understood. However, it concurs with a literature review commissioned by the Design Council, UK (*The Impact of School Environments*, 2005), that is, that the evidence is unequivocal with regard to the importance of user engagement in defining and solving individualised and local problems in education spaces - the Council (2005, p. 37) concluded that the most successful learning spaces are likely to be those that have within them “elements of flexibility and adaptability for new cohorts of learners and teachers, new curriculum demands and new challenges”.

Whilst this review has also brought together the concepts of personalised learning, flexible, innovative learning spaces with access to technology as a portal in the wider world, it has identified a shortfall of evidence in the international literature that a) embodies these concepts in relation to the occupation of new hospital spaces; b) harnesses the opportunities provided by a new hospital building as a catalyst for the enjoyment and engagement of learning for children and young people; and c) that incorporates the value of creating access and opportunities to parents and health professionals as partners in children’s learning.

The Charter for Children’s Learning at the Royal Children’s Hospital research project will address this gap.
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A Charter for Children’s Learning at
The Royal Children’s Hospital

Literature Review
June 2010

Dr Susan Wilks, The University of Melbourne

Prepared for and in collaboration with the Royal Children’s Hospital Education Institute
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For more information about the development of the Charter for Children's Learning at the Royal Children's Hospital, contact julie.green@rch.org.au
Introduction

This literature review is the first stage in a project to develop an evidence-based Charter for Children’s Learning at the The Royal Children’s Hospital (RCH), Melbourne.

As the leading provider of paediatric health care in Victoria, the RCH is an important site for children who spend vital hours of their lives having their health needs met. Children who experience poor health are at higher risk of lower educational achievement\(^1\). They are more likely to experience academic failure (Needhan, Crosnoe & Muller, 2004), less likely to complete high school (Conley & Bennett, 2000) and less likely to go on to post-secondary education – transitions that are critical to their later occupational attainment, earning ability and quality of life (Haas & Fosse, 2008).

The early years of children’s lives are particularly important to laying the foundations for literacy and for children’s perceptions of themselves as learners. Strong links between health and education during hospitalisation are, therefore, critical to children’s longer term outcomes.

The development of a Charter for Children’s Learning at the RCH is intended to build on the current evidence base and inform a hospital-wide approach to provide children and young people with an alternative and engaging learning site during periods of health care.

A Charter for Children’s Learning at The Royal Children’s Hospital

The Charter project, led by the RCH Education Institute, links the health of children attending the RCH with the development of a sustainable, hospital-wide approach to simultaneously support children’s learning and education during their time at the RCH. It is particularly focused on creating a rich environment for children and young people in the new RCH, due to be opened late 2011.

The development of the Charter is underpinned by contemporary understandings about children’s learning and a philosophy to assist children to engage with hospital-based learning spaces that are complementary to learning at school. The project focuses on children attending the RCH who are in the pre-school, primary- and secondary-school years (3-18 years) and their families.

Children are constant seekers of knowledge from their life situations and are participants in their own development (Shonkoff & Phillips, 2000). It is important that children’s learning stays relevant to their lives and that they engage with alternative learning spaces and places that lie beyond school (Comber, Nixon & Reid, 2007).

While many paediatric hospitals worldwide, including the RCH, have education services that support the maintenance of children’s connection with their schools and school communities, there is no known research that has attempted to develop a Charter for learning or studied a children’s hospital as an alternative learning site that promotes rich, high quality learning environments, hospital-wide.

This literature review provides a platform for the Charter project. It outlines relevant educational theory, practice and policy and highlights the role that effective spaces play in best practice to teaching and learning in schools and out-of-school environments. It examines the literature on successful cultural

\(^1\) For a more extensive overview of the literature on the educational needs of children and young people with health conditions, see Edwards, Henry, Green and Meade (2010) ‘Young People with health conditions: Staying Engaged during the senior years of education’ http://www.rch.org.au/edinst/research.cfm?doc_id=10292
shifts in the adaptation to new learning spaces, including the contribution of the Arts and innovative use of e-learning technologies.

Given the scope of the Charter for children 3-18 years, the review outlines developmental stages of learning for children and young people in this age range and the place that consultation with young people about their learning preferences has in education. The literature review concludes with an overview of Victorian government education policies on the creative use of spaces for learning.

The relationship between education and learners

Currently, the institutional relationships between education, curriculum and the learner are being re-examined. Clearer pictures of what pedagogies might constitute in the 21st century are emerging. Central to this is a developing awareness of the need for diverse learning spaces that offer multiple approaches to the acquisition of knowledge skills and more emphasis on learner-learner as well as teacher-learner interactions. The philosophy of a small school established by a far-sighted educator demonstrates how it placed the needs of young people centrally through both place and pedagogy:

The future belongs to young people who know how to create and participate in learning communities; who know where knowledge is, how to get it, how to think about it and how to use it. They are the ones who will be able to take the greatest advantage of whatever opportunities an unpredictable and rapidly changing world throws their way. The best way to expose students to the Information Age is to place them right in the middle of it².

Twenty-first century learning models, with their emphasis on collaborative project- and inquiry-based models, together with wireless technologies, have led to what is often described as anywhere, anytime, ubiquitous learning. New partnerships between learners, educators and the community members open up the possibility of learning across institutions, engagement with informal as well as formal learning spaces, different individuals and organisations and the creation of flexible learning communities. This, combined with calls to personalise learning, suggests the need to cater for different learning styles, needs and interests and a greater choice over what, where and how they learn and who they learn with.

Despenza-Green (Director of the National School Initiative, Chicago, in Rudd et al., 2006) stressed that before thinking about the physical, educators need to consider what sort of education they want for their students and check the extent to which their existing physical structures enable it. The OECD’s Schooling for Tomorrow group³ believed that immediate contextual dimensions such as partnerships with the community, wide cultural influences and critical factors such as the role of the learner, the organisation and pedagogy are all crucial.

In relation to children’s health and wellbeing, new learning spaces – indoor and outdoor – could have embedded “tactile, sensory and playful learning tools firmly within the design process, thereby creating both very different and non-threatening environments” (Rudd et al., p. 8).

Observation of students’ preferred learning places has led to the provision of new informal learning spaces resembling cafes, lobbies, student union areas, viewing rooms, and library nooks together with multipurpose spaces and classrooms. Given clear teaching and learning aims and appropriate usage, almost any space can be a field for learning.

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² PS1 Charter School, Denver, USA set up by Rexford Brown (Author of Schools of Thought, 1993) in the late 1990s.
³ www.oecd.org/topic/
A brief overview of relevant educational theory, practice and policy

The principles and beliefs of the pedagogical models of constructivism (e.g. Krause et al., 2003), authentic learning (e.g. Newmann & Associates, 1996) together with critical theory (with its foundations in Friere), and Lave and Wenger’s (1991) concept of communities of situated learning are being interwoven with the principles of design and usage of built environments in the 21st century. The elements of interactive, dynamic and creative spaces, visual transparency and appropriate acoustic containment are all viewed as vital components of educational spaces (Featherston). A shared understanding of appropriate pedagogical practices needs to be in place as educators and students occupy new spaces.

In a learning model called “critical activism” (Hildebrand, 1999) students learn to be actively critical with/in a community. It is this model that the new pedagogies foster and innovative learning spaces support. Generally, educators who use constructivist approaches favour the inquiry and/or problem based learning models (from Perkins, Paul, Gardner, etc) underpinned by Vygotsky’s belief (1986) that meaningful knowledge is constructed within socio-cultural contexts where shared understandings develop through interactions with others and where the teacher supports or “scaffolds” the students’ learning. It is commonly recognised that people have preferred thinking and learning modes and different attention spans and that learning spaces can provide the environment to foster individual development. Catering for individuals might mean designing spaces for kinaesthetic, auditory, spatial, personal, interpersonal and visual learning (referring back to Howard Gardner’s ‘Intelligences’, 1983 & 1993).

The provision of flexible learning spaces has been found to prompt staff members to form close relationships with their peers and students. Team building and collaborative teaching models lead both teachers and their students to enjoy new teaching and learning models. On occupation of the new spaces, behaviour management issues are said to no longer be an issue. It is believed this is because students feel privileged to belong to specially designed spaces that have eradicated the ‘stage’ for misbehaviour and the new pedagogies are engaging them.

The requirements of state curriculum documents (e.g. Victorian Essential Learning Standards) and national Australian curriculum frameworks need to be understood in the context of the physical environments necessary to support 21st century learning. Based on the findings of the Middle Years Research and Development Project’s findings (MYRAD) (Hill and Russell, 1999), the Principles of Learning and Teaching (P-12) (PoLT) have driven a reflective process in which educators have engaged in conversations about pedagogical practice (Cara, 2009) that can be used to build these understandings.

The Constructivist learning model and new initiatives such as the use of Conceive, Design, Implement, Operate (CDIO - www.cdio.org), along with planning aids such as the Victorian Department of Education and Early Childhood’s e5 Instructional Model (Engage, Explore, Explain, Elaborate, Evaluate) can be used to explore alternatives to traditional curriculum delivery modalities.

The role effective spaces play in connection with best practice teaching and learning

Today, educators are expected to identify the needs of the active, whole learner while expanding their own understanding of built, natural and cultural environments as teaching and learning tools. Hospitals, for example have classrooms, lecture areas, case rooms, u-shaped rooms, multipurpose and seminar

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4 Mary Featherston, designer of school interiors in Victoria, industry partner in the ARC Linkage Project Smart Green Schools (University of Melbourne, 2008-2010).
rooms, break-out areas and recreational facilities. A study of adolescent-friendly recreational facilities (Ries et al., 2008) reminds us that physical activity improves both physical and mental health e.g. attention spans and that usage of recreational facilities is governed by physical, social, organisational and economic factors.

Taylor (2009) believed that once we learn to ‘read’ an environment, we have cultivated what she called the *knowing eye*. Architect Robert Peters (in Taylor, 2009) described this as a type of visual literacy that enables us to see and critically analyse the physical world and read the environment with deep understanding. Taylor believed that developing the knowing eye meant temporarily suspending the past and opening ourselves to new possibilities.

**What is an effective, innovative learning environment?**

For the purposes of this literature review the definition of an effective leaning space is a setting in which learning takes place as an active process and fosters the capacity of learners to apply knowledge and skills flexibly and creatively in a variety of contexts.

Leaders behind the creation of effective learning environments have a distinctive approach to the ways learners, resources, technologies and facilities inter-relate. Innovative settings together with interdisciplinary and multi-level pedagogical aims, ensure that cognitive, metacognitive and socio-emotional learning needs are catered for.

The emergence of new practices, pedagogies and technologies is questioning what Tyack and Tobin (2004, in Weiss, 2007) called the existing “grammar of schooling” (a set of prescribed social, political and cultural boundaries similar to the rules of grammar in language). The variety of learning spaces and forms of communication, data retrieval and storage, and interaction with people within and beyond the “school”, have challenged the power relations embedded in the architecture that supported teacher-centred learning environments for decades.

Shifting students away from being in rows of desks where only the teacher has the freedom to move, together with the influx of new technologies, constitutes a major change for some educators because their identity, their view of the learner, and their ways of operating are challenged. Many educators will be resistant to change, but by interrogating their existing practices in the light of new learning spaces, educators, nurtured and supported by administrators, can take advantage of the spatial and temporal opportunities offered by new pedagogies and technologies.

Young people with access to technology integrate mobile and computing activities into their daily lives through telephones, email, MySpace and face-book etc. Increasingly, innovative educators are using collaborative and interactive software like wikis and blogs to extend the boundaries of their classroom (Davis, 2006, in Weiss 2007). These innovations allow for access to and from the wider world – announcements, assignments and student work can be posted, giving parents and the community monitored access to the classroom. Flexibly designed pedagogical frameworks and learning spaces that incorporate new networks and technologies are required.

According to CERI, the four elements that constitute the learning process - learners, content, organisation and “teachers” (this includes members of the community, experts, parents, other children and young people) - are always present in a learning context. Those working in learning environments aim for, and hopefully achieve, certain stated outcomes. Some basic categories around which learning could be organised and embedded in a *spatial learning context* appear below:

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5 This definition is based on content in a report of The Centre for Educational Research and Innovation [CERI] (OECD, 2007).
The Spatial Learning Context – Learning Processes:

- a diversity of pedagogical approaches, teaching styles and expertise
- a mix of loosely and tightly defined curriculum
- catering for a wide ability range including special needs’ learners
- face-to-face and distance learning
- collaborative groupings and individual inquiry
- involvement of experts and community members
- using community spaces and environmental resources
- rich mix of Information Communication Technology and digital resources
- guidance, feedback and outcomes.

(Learning processes and models based on the CERI Report, 2007)

Kalantis and Cope (2005), writing about situated learning, advocated the need for educators to configure and re-configure the various physical and technological resources at hand to create environments that enabled student collaboration and provided opportunities to create meaningful, contextualized work. This included developing “authentic” materials that could exist independently of a classroom and spaces using technologies that enabled students to communicate with the world beyond their learning space. They saw it as important for these elements to be incorporated into both curriculum and pedagogical design.

Until recently, educators have tended to refer to the “environment” in abstract terms, usually psychological states rather than the physical form of the spaces in which they are operating. Professional development has concentrated on improving mood or quality of a learning place, not the physical space per se. Teacher educators talk about classroom management and atmospheres conducive to learning or encouraging risk-taking. It could be inferred that the belief is that teachers’ skills can overcome physical learning environment deficiencies. Rather than the emphasis being on the teacher, Taylor (2002) believes that “The goal is to encourage the development of learning environments with an overall aesthetic that respects and empowers students, is based on the real world, and reinforces the concepts of hands-on problem solving” (2002, p.28). For example, if the desire is for young people to develop curatorial skills, then assist them to collect and make objects and design settings with display and storage spaces. In this way learning will be related to life. The following example illustrates these characteristics of real-world, hands-on learning:

An educational example

A diverse learning community might comprise a network of educators who seize learning opportunities wherever and whenever they appear. Parents, students, teachers, health professionals etc could work together to design and contribute to fresh and challenging interdisciplinary and differentiated learning experiences for both disadvantaged and able students, maximizing the use of the available spaces and technologies. For example: Internships – linked to with (other) schools, businesses and organizations, Community learning – participation in community projects, Student-taught classes – developing materials to be taught to other learners, and Projects – in collaboration with learners within and outside the learning setting. There could be an emphasis on performance for, and presentation to, various communities (parents and wider) in a range of spaces and the opportunity to attend workshops physically and on line e.g. scientific experiments and

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6 This example is drawn from development of the content of a PS1 Charter School Curriculum Guide, Denver Colorado. (Accessed 2002.) School founder Rexford Brown
When discussing the built environment Taylor (2009) stated that behind every space structure and item of decoration or furniture there is an idea or concept. People “read” physical objects and spaces and assimilate them. This is design as pedagogy.

Physical elements in the environment can act as visual cues or prompts for learning. This is often described as three-dimensional textbooks or leaning tool. Taylor (2009) described the physical environment as a *silent curriculum* (p.25) that, although nearly invisible to its users and visitors to the spaces, provided positive or negative learning experiences.

Some may claim that a good teacher can teach anywhere and a willing student can learn anywhere, but this might mean they make do with poor conditions. Taylor believed the powerful effect of the physical learning environment on teaching and learning is overlooked. She quoted her own and other studies that had shown that environments affect achievement and learning outcomes (e.g. Moore and Lackney, 1992; Schneider et al., 2002).

The arrival of the Ultranet into every Victorian school and education centre in 2010 will transform communication and potentially end isolation. It is a protected online environment for users anywhere and anytime that not only provides a learning platform for teaching and learning, but also allows parents to become more involved in their children’s education. Students will be able to communicate and collaborate with other students within their school and across the state and teachers will be able to co-create curricula, collaborate with teachers at other sites, monitor student progress and provide online assessment. Parents will be able to see, among other things, learning tasks, teacher feedback and learning progress.

New technologies can also transform the feel of a space so that it feels safe, quiet and stimulating. Lighting can be activated by sensors, programmed sounds can be fed in, pictures, videos and screens can relay powerful images and text, and new acoustic treatments benefit most rooms used for speech and music.

**Developmental stages of learning for children and young people**

All age groups share the need to belong, have a sense of ownership of learning spaces, experience feelings of familiarity and security, and operate in spaces that facilitate routine while supporting diversity. Young people also need to increasingly be able to experience independence, develop a sense of self, appreciate diversity and build relationships as they move through stages of development. As they move towards the middle years, the need for privacy means that opportunities for young people to ‘retreat’ or ‘escape’ are required without impeding behaviour management. At all ages it is important for them to contribute to, and feel validated by, family and community (Rubida: www.rubida.net).

As the stages of learning and maturity progress (e.g. Piaget (cognitive), Kohlberg (moral) http://www.aggelia.com/htdocs/kohlberg.shtml), the need for flexibility of the space increases until, in the final stages of learning, the environment provides a range of spaces and facilities that respond to individual needs.

The extent of acoustic separation required at all stages is determined by the learning activities’ requirements. The range and quantity of interactive, creative and reflective zones offered also need to

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7 Source: PS1 Curriculum guide.
correspond with age and pedagogies. Stages of learning8, relevant to the Charter project, are described below and summarised in Table 1:

**Early years (age 3-8):** Children require spaces that: invite and support a strong presence of family and community, enable guided activities, facilitate routine, and offer security and familiarity. Opportunities for retreating, brief interactions and activities, one-to-one withdrawal, constant supervision, and building a sense of ownership and place are required.

Montessori, whose influence on early years’ education has reverberated since the early 1900s, was amazed at how children's attention could be transfixed by objects in the world around them. Believing that effective learning spaces were those designed to promote exploration and individualised learning. Spatial organisation became a key to her educational theory – still influential today9.

**Years 3-4 (age 8-10):** Children in this age group are becoming more independent learners and their peer interaction is increasing. Routine, ownership and a space to belong to are still vital, as are family and community presence. Activities, whilst still highly structured, need to offer opportunities for the building of confidence when dealing increasingly with diverse groups of people. One-to-one withdrawal areas are still required, as are areas that allow for conflict resolution. Students are increasingly able to spend quiet time and complete tasks alone. The latter can be viewed as an indicator of behaviour management. A ‘home’ room is vital.

**Years 5-8 (age 10-15):** Children and young people are beginning to connect strongly with their peers and the wider community and interact in an independent manner. There is a strong need to retreat and reflect at times while still needing the security of structure, routine and family presence. While one-on-one work and guided conflict resolution are still required, from this age, students learn to make choices about appropriate behaviour and ways of applying the skills they have developed. Due to the belief that students should belong to the whole space, there may be no fixed space for student belongings. They also begin to interact with a broad range of people in an independent way and understand the wider community.

**Years 9-10 (age 15-16):** Young people have a strong sense of self, are reliant on communication and interaction with peers in a variety of spaces, but also need opportunities for independent work and quiet time. They need withdrawal (small group) and private and communal areas, but do not require a fixed space for their belongings. They interact with a broad range of people including the wider community.

**Senior Secondary years (age 16-18 years):** Young people are beginning to pursue individual pathways and have developed independent working habits although still requiring structure, communal and private spaces and opportunities for peer interaction. Quiet or ‘free’ spaces are important for adolescents for reading, researching, doing homework, or merely ‘escaping’ from others.

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9 Featherston constantly refers to Montessori when describing her own designs.
<table>
<thead>
<tr>
<th>Age</th>
<th>Characteristics important to learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early years</td>
<td>Space that:</td>
</tr>
<tr>
<td>(age 3-8)</td>
<td>- invite and support a strong presence of family and community</td>
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<tr>
<td></td>
<td>- enable guided activities, facilitate routine, and offer security and familiarity</td>
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<tr>
<td></td>
<td>Opportunities for retreating</td>
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<tr>
<td></td>
<td>Brief interactions and activities</td>
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<td></td>
<td>One-to-one withdrawal</td>
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<tr>
<td></td>
<td>Constant supervision</td>
</tr>
<tr>
<td></td>
<td>Building a sense of ownership and place</td>
</tr>
<tr>
<td>Years 3-4</td>
<td>Growing independence as a learner</td>
</tr>
<tr>
<td>(age 8-10)</td>
<td>Increasing peer interaction</td>
</tr>
<tr>
<td></td>
<td>Increasing ability to spend quiet time and complete tasks alone</td>
</tr>
<tr>
<td></td>
<td>Family and community presence</td>
</tr>
<tr>
<td></td>
<td>Opportunities for the building of confidence when dealing increasingly with diverse groups of people</td>
</tr>
<tr>
<td></td>
<td>Spaces that provide for:</td>
</tr>
<tr>
<td></td>
<td>- A sense of ownership and belonging</td>
</tr>
<tr>
<td></td>
<td>- One-to-one withdrawal</td>
</tr>
<tr>
<td></td>
<td>- Conflict resolution.</td>
</tr>
<tr>
<td></td>
<td>- A ‘home’ room</td>
</tr>
<tr>
<td>Years 5-8</td>
<td>Stronger connection with peers and the wider community</td>
</tr>
<tr>
<td>(age 10-15)</td>
<td>Growing independence and interaction with a broader range of people</td>
</tr>
<tr>
<td></td>
<td>Strong need to retreat and reflect at times</td>
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<tr>
<td></td>
<td>Still needing the security of structure and routine and family presence</td>
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<tr>
<td></td>
<td>Needing one-on-one work and guided conflict resolution</td>
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<tr>
<td></td>
<td>Learning to make choices about appropriate behaviour and ways of applying new skills</td>
</tr>
<tr>
<td></td>
<td>Belief that students should belong to the whole space</td>
</tr>
<tr>
<td>Years 9-10</td>
<td>Having a strong sense of self</td>
</tr>
<tr>
<td>(age 15-16)</td>
<td>Reliant on communication and interaction with peers in a variety of spaces</td>
</tr>
<tr>
<td></td>
<td>Spaces and opportunities that:</td>
</tr>
<tr>
<td></td>
<td>- facilitate withdrawal (small group) and private and communal areas</td>
</tr>
<tr>
<td></td>
<td>- foster independent work and quiet time</td>
</tr>
<tr>
<td></td>
<td>Needing to interact with a broad range of people including the wider community</td>
</tr>
<tr>
<td>Years 11-12</td>
<td>Beginning to pursue individual pathways</td>
</tr>
<tr>
<td>(age 16-18)</td>
<td>Developed independent working habits although still requiring structure</td>
</tr>
<tr>
<td></td>
<td>Spaces and opportunities that:</td>
</tr>
<tr>
<td></td>
<td>- are both communal and private</td>
</tr>
<tr>
<td></td>
<td>- allow for peer interaction</td>
</tr>
<tr>
<td></td>
<td>- are quiet or ‘free’ spaces for reading, researching, or doing homework, or merely ‘escaping’ from others</td>
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</tbody>
</table>

As they mature, students are increasingly willing and able to explore the meaning of space and design and describe their preferred spaces according to personal needs, educational activities and relationships with other people. Back (1998), writing on privacy in hospitals and adolescence, said it is considered important by adolescents, especially those who were frequently admitted, to have some control over such spaces (i.e. not being interrupted or walked in on). Privacy, according to Back, included solitude, anonymity, intimacy and reserve. This knowledge, s/he believed, necessitated researchers to examine the meaning given to space. S/he found that adolescents were not in denial...
about being in hospital for treatment and had incorporated this into their spatial needs without identifying solutions that were excessive or unrealistic.

**Consulting children and young people about their preferences**

New pedagogical approaches cater for relationships between children and young people of varied ages and stages. What features would spaces that cater for knowledge exchange and mentoring between mixed ages and stages - a scenario that might occur in hospital learning spaces - require? Children and young people could be asked their opinion, a practice that is on the increase in some Australian hospitals through youth advisory councils and consumer representation processes.\(^\text{10}\)

The issue of encouraging and including the young person’s voice has been highlighted in the recent findings of The University of Melbourne’s *Keeping Connected* Australian Research Council and RCH Education Institute funded project (Yates et al., 2010). The 31 young people with health conditions played a central role in producing visual and narrative accounts of the stories they want health and education professionals to hear about their needs and experiences, including their institutional encounters. The study highlights wide-ranging diversity of experiences, needs and views of young people in dealing with their health conditions, and that their voice – as well as that of effective advocates – is an important element in improving outcomes for young people. Further, the *Keeping Connected* findings underscore the need for hospitals in which young people spend time to acknowledge and support their pursuit of education as a vital part of their overall health and wellbeing.

Lave and Wenger (1991) described how participation in learning is also structured by power relations with the design of learning spaces allowing for certain kinds of participation while excluding others. In order to change the use of space it is necessary to reinvent what the ‘architecture’ of the learning space says about modes of participation. This often causes existing ‘power relations’ to be de-stabilised. Consultation with all potential users, ensuring they participate in discussions about, and trial the use of new spaces, is therefore essential. Part of this process will involve finding ways of ‘making’ people look at spaces and objects in a different way and assisting them to gain insight into the potential of things they see in their everyday life but don’t think about, e.g. the content of a painting or the design of a table. This could be described as developing people’s “Spatial Intelligence” (Gardner, 1983).

**Relationships between spatial designers and clients**

Taylor (2002) believed that educators should provide architects and the community with an “academic blueprint” as they contemplate new or refurbished education facilities design. This entails certain spatial understandings. Further, she believed that “architects have a reciprocal responsibility to teach the public that the design of physical spaces matters, and that they can be read and translated by our minds into ideas for better understanding of our relationship with the environment” (2002, p. 31).

It is important for designers to understand the new educational pedagogies and produce more innovative learning environments. Educators, students and school community representatives and designers should collaboratively explore how ICT, space and place can impact on or support their pedagogical practices. New builds give clients the opportunity to “reengineer” ICT, space, and place in connection with the pedagogical and operational cultures of schools, departments and other educational units. (See *The New Learning Environment: Hybrid Designs for Hybrid Learning* [www.woodsbagot.com.au/.../PUBLIC2%20The%20New%20Learning%20Environment.pdf.])

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\(^{10}\) The Royal Children’s Hospital, for example, has its Youth Advisory Council – Y@K – and a commitment to being an adolescent friendly hospital through its Adolescent Model of Care work program.
Designers need to get to the bottom of how and why teachers, other professionals and students currently operate the way they do. This requires consultation, collaboration and “co-construction” of learning environments and time for the various professions to learn each others’ vocabulary.

Nair and Fielding (http://designshare.com/patterns Accessed 30.5.10) believed that educators’ lack of common design vocabulary and graphic pattern language meant that designers needed to be provided with diagrammatic patterns (i.e. rough sketches of big ideas) and illustrative patterns (more detailed sketches). Plans are of little use if they can’t be understood. If health professionals and educators are to interrogate hospital spaces, they could assist designers, by, for example:

1. Naming spatial problems they foresee or have experienced.
2. Describing possible solutions for meeting their stated goals for spaces.
3. Helping the designer address their issues and questions.
4. Understanding that there can be many paths through the design [and occupation] process.

Nair, in 2005 (www.designshare.com/index.php/articles/schools-good-for-children/ accessed 30.5.10) claimed that a building that looks like a “school” may actually be saying a lot that goes beyond its architecture. No one questions that good hospital architecture is about creating effective places for healing, but if the architecture of a children’s hospital aspires to about health and learning, “shouldn’t it support various learning modalities and allow its users to constantly tailor and modify their space to meet changing needs? Shouldn’t it, most of all, be about what children need for their special developmental needs at various stages in their lives?” (Nair, 2005).

Nair raised further relevant points for hospital staff to consider when he discussed good airport architecture. Like airports, hospitals work to get people to their destinations as efficiently as possible while simultaneously attending to their physical, mental, spiritual, and learning needs as they wait or move from one part of the building to the other. Architecture, interior design, furnishings and art works all play an important role here. They can entertain, comfort and educate the users who, in the case of a paediatric hospital community, include children and young people as inpatients and outpatients, parents/guardians, siblings and extended family and others.

Brase (in Rickes, 1997) after inhabiting newly designed spaces that were not satisfactory, was able to say with hindsight that, during the planning stages, the users should have stressed that effective learning space design was critical. Brase sent on to identify that it would have been beneficial if the staff had provided the designers with unambiguous and understandable design objectives that everyone could understand and insisted that the specified criteria were specific enough to be able to hold the designers accountable. Allied with this they realized they should have required follow-up by the designers to ensure that design criteria were met.

The Department of Education and Early Childhood Development has produced excellent publications to support this process (see the section of this paper, ‘Government education policies on the creative use of spaces: the Victorian context).

The contribution of appropriate learning spaces

Spacious, light filled, dynamic and varied learning environments – formal and informal – that support varied learning modes are essential. Meeting places to learn include distributed learning areas, lecture rooms, discussion spaces, retreat areas, information centres, wet areas, projection and storage spaces, stages and mezzanines, discussion pits, counseling spaces, lounge areas, outdoor and eating areas and spaces beyond the education facility. The innovative use of specially designed furniture should accompany each space.
Interaction between staff and young people is enabled by particular spatial arrangements. Exchanges between staff-and-staff and staff-and-students can occur either in public spaces, in rooms where specific tasks are to be carried out, in smaller support spaces, and circulation spaces (e.g. landings on stairways, walls punctuated with lounges and courtyards). New ideas and different approaches come from exchanges and “You can actually feel the way the building acts as an intellectual catalyst” (Wang, in Rickes, 1997, p. 134).

In six newly-constructed hospitals Pati, Harvey and Cason (2008) interviewed staff to ascertain what features of the built environment the users’ (i.e. the health carers) believed supported or impeded different types of flexibility of inpatient medical-surgical units. The staff connected many of their built environment needs with adaptability, i.e. to meet the needs of the patients. Some of the study’s findings and recommendations that emerged from content analysis (Miles & Huberman, 1994) were of relevance to the establishment of learning spaces in similar settings, viz:

- different stakeholders will define flexibility differently and according to their role
- provide storage spaces in work areas and cabinets in rooms and by beds
- create simple layouts to improve visibility – staff-staff and staff-patient
- utilise modular, mobile carts in equipment, medication and dietary rooms
- minimise the electrical and mechanical components of rooms to optimise the potential for space conversion.

**Designing learning spaces: a hospital-specific example**

A group of Harvard University students undertaking a ‘Designing Learning Spaces’ unit under Dan Gilbert (2008) explored possibilities for an upgrade of The Lucile Packard Children’s Hospital School (Harvard) due for completion by 2013. Gilbert’s process for a learner-centred approach for designing learning spaces for hospitals but which equally apply elsewhere, comprised:

1. Understanding the learners and other people associated with the spaces.
2. Identifying what activities will be taking place.
3. Brainstorming and generating ideas.
4. Planning and creating: proposing and implementing solutions.
5. Measuring the outcomes.

Gilbert suggested that, in order to understand needs, his students should create young peoples’ ‘personas’ with a variety of health issues and the physical challenges each would represent. They needed to ask: What are their relationships with others like? How does this impact on their school progress? Who are their friends and to what extent do they help them – before and after hospitalisation?

The hospital staff interviewed during this project believed the personas accurately reflected real cases. They added other issues to consider like: adolescents’ reluctance to attend the hospital school because of their appearance and the feeling of isolation when friends stop visiting.

The observation phase of the spaces involved noting current use; interaction between users; attempting to understand the emotional as well as physical needs of the students; and identifying key behaviours and actions of the hospitalised students. Grounded in learning theory and the design process, the students made recommendations for the ways a hospital setting could meet young people’s academic and socio-emotional needs. Although they believed that life was not normal in almost every area of the

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11 Site access granted to researcher.
hospital, they advocated the provision of education ‘spaces’ that provided an oasis of normalcy and were respectful of the needs of individuals. First, the students asked themselves what counted as a space. They wanted to limit the extent that medical conditions limited individuals’ achieving to the best of their ability and, following observation and interviews, envisaged three learning spaces connected by a community of learners (Lave & Wenger, 1991): community, bedside learning and virtual learning – described in the footnote 12.

Items for consideration, which the students included as ways of assessing the effectiveness of spaces, included:

1. For the community/classroom space – the effectiveness and amount of work completed before and after the new space was used, whether more students were attending, if the space better met teacher needs, and what, if anything was required to augment or change the space to make it most effective.

2. For the “Rolling lap-desk” (the bedside learning) – amount of work completed, changes in study patterns, ease of completing work, the time it took to change the hospital space to a study space, and whether the teachers found it easy to work with.

3. For the virtual space – usage patterns by students and teachers. For students: How many logged on? How much ‘academic' work was completed? Was there a change in quantity? Were there changes in self-image of any isolated students? For teachers: Ease of use of system and whether the system improved their connection with students.

Supporting innovative use of (e-)learning technologies

Portability and personal ownership of mobile devices increase learning opportunities in a range of spaces. They offer opportunities to capture, access, manipulate and publish information. But, according to Weiss (2007), studies show that currently, even when digital resources are integrated into learning activities, they are largely used for word processing, basic web search and keyboarding and their communicative and collaborative potential as resources is not being realised. Because they have been incorporated into existing classroom spaces in this way they are merely reaffirming the “grammar of schooling”.

12 a. Community space/classrooms. This could be something like a ‘traditional’ separate learning space that students could attend to get away from procedures, parents and nurses. To meet the students’ needs, and the learning goals they had established (ie. normal life, respect for needs, academic achievement) their design contained walk- or wheel-in storage for teachers and students, breakout spaces that allowed privacy, flexible work spaces, power outlets and cabling on floor (cordless where possible), wide walkways, moveable tables with whiteboard tops, colour for inspiration, natural light and indoor-outdoor connection. They designed personalised storage bins for students.

b. Bedside Portable Learning. Alongside IV poles and outlets for various medical devices etc, the students wanted functional learning spaces for those confined to their beds where their medical needs could be forgotten (to the extent this is possible). Although difficult to achieve given Health and Safety issues, they designed a mobile cart for bedside learning that they called a Rolling lap-desk as a possible learning space. It could be folded away, but contained a space for a laptop, a removable storage bin, a hook for a backpack, ‘in’ and ‘out’ folders, a slide out desk, and a slide out white board. They also designed a coloured, lightweight teacher’s bag consisting of slots for ‘in’ and ‘out’ folders and pockets for pens [thumb drives] etc.

c. A Virtual Learning community that united all learners without and outside the hospital environment. They proposed a virtual school classroom where students, as Avatars, could carry out experiments. Virtually the students could also link up with other students throughout the hospital, the teachers, and the hospital’s community/classroom. The students also suggested a Video streaming capacity that captured the students’ school of origin classroom to enable communication for isolated students to communicate with their school. This capacity or Skype could also link them with home.
By scattering ICT throughout the building, student-centred and directed learning is encouraged. As this paper is written, technologies are changing and innovations are constantly occurring. Today, the minimal requirements for education are a wireless network, laptop computers, phones, an electronic teaching management system and technologies that enable distributed learning – e.g. online, via Skype, video conferencing. Social software is part of students’ daily lives, e.g. blogs, wikis, and bookmarking tools. Such tools lead to shared ownership over information and content. Digital technologies offer the opportunity for flexible, distributed learning providing opportunities for learners to engage with diverse environments and force us to reconsider what learning might look like.

In the UK, Notschool for example, is an online support network of buddies, mentors and experts to support learners in non-formal learning settings (www.notschool.net/ns/template.php). Space Mission fostered new approaches to learning. It enabled learners to work collaboratively in teams using interactive material, video-conferencing and messaging to communicate with one another and remotely located experts (www.futurelab.org.uk/showcase/space_mission).

In an article evaluating radio frequency identification systems (RFIS) in hospitals, Fisher and Monahan (2008) raised relevant issues for the introduction of new education technologies for patients and other personnel and their potential to improve hospital functions. They stressed that the integration of these technologies into hospital practices often results in dramatic changes in management, division of labour, and accountability. They cautioned that the introduction of new technologies must be studied in particular social contexts and their caution can be extrapolated to information technologies associated with teaching and learning in hospital spaces. Their recommendations apply broadly:

First, hospital administrators should craft clear management goals. This includes defining, in advance, the intended goals and functions of the systems, the ways in they fit into the broader management plans of hospitals, and rationales for their use.

Second, the associated responsibilities, including operation, technical assistance, evaluation and training, should be mapped out and negotiated in collaboration with staff members prior to implementation and should be revisited periodically. Anticipating likely increases in workloads and staff surveillance and explicitly negotiating policies with staff will likely engender greater staff support and more successful incorporation of the systems.

Third, the distribution of material resources should be evaluated and planned for well in advance. Administrators and staff should assess the types of technologies and associated spatial resources required and the potential physical constraints such as storage issues.

Fourth, it is critically important that the design of such systems and interfaces are technically functional, intuitive, easy to use, and as complementary as possible to established practices and processes of delivering care at the hospital. Additionally, hospitals should expect that these systems will require ongoing investment in staff positions and technical supplies.

Fifth, the attitudes of the staff should be ascertained and should inform the range of functions for the systems in each hospital setting. It is important to ask how each group of hospital staff perceives the workload associated with the systems, stressing and demonstrating the advantages and the utility of the RFID systems for patient care and wellbeing.

Technologies must be understood within their social contexts and not as external forces applied discretely to social problems.

When thinking about the role technologies can play in both public and private arenas, a field that is receiving increased attention from scholars interested in communications theory is ‘Entertainment-
Education’ (EE). Defined by Singhal and Everett (2002, p.117) as the intentional placement of educational content into ‘entertaining’ media messages, it is an intervention strategy that can be used to disseminate ideas through entertaining media sources that bring about behavioural and social change. Today, the power of media like movies, television, music, spectator sports, newspapers, phones, advertisements and internet to influence emotions and actions, is not questioned.

Like the above, contrived EE interventions are believed capable of modelling self-efficacy – where an individual’s capacity to deal with or have control over a situation is modeled (e.g. eating the right foods to lose weight and be healthy). Interventions are also believed capable of modelling desired behaviours like taking medication or applying sunscreen. Lieberman (2001) found a positive effect of an EE game called ‘Click Health’ which was designed to assist children to live with diabetes. Singhal and Everett (2002) also reported that research has shown that EE interventions evoke interpersonal communication between the audience, friends and relatives. EE supporters believe that emotion has the power to trigger preventable poor health behaviours (e.g. showing how a health event brought on by some kind of abuse affects a family). Such examples of EE interventions require careful aims, planning, and skillful management.

Those interested in Entertainment Education are social learning, social construction and social cognition theorists and also people interested in achieving audience involvement. The internet can always be part of EE, but it is important to remember that the less educated, poor and rural populations may have little access to it. As well, resistance to EE may come from those who view it as a ‘big brother’ intervention. To maximise acceptance, coherent, pleasurable and entertaining narratives, not too heavy-handed about the educational message, are advisable.

**Successful cultural shifts in the use of learning spaces – The future**

The emergence of digital technologies, the role of education viewed as lifelong learning, and the push to see the role of schools as resources for the community are setting up radical notions of ‘the school’. Heppell et al. at Ultralab (rubble.heppell.net/places/media/final_report.pdf) outlined four possible future scenarios that exemplified possible educational futures where educational visions included individualised, community-based and vocational approaches, where diverse uses of technology increased connectivity and delivery, and diverse learning included situated, remote and collaborative learning practices. Ultralab posed four radical directions to ponder:

1. Learners based at home, learning from experts anywhere in the world.
2. Secondary schools operating like a university with faculties each offering an area of expertise.
3. Time is spent on a campus but learning takes place whenever and wherever it is needed.
4. A school where at all times the business of formal learning was carried out with no distractions.

Alternative education visions that cause us to rethink our educational assumptions and practices include:

- ‘Classes’ contain students of any age.
- Spaces in which learners feel comfortable.
- More teachers working collaboratively in spaces.
- Spaces designed to maximise learner control of resources.
- Time and space boundaries are flexible.

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13 Similarly, personal response systems, or "clicker" technology, are devices that allow instructors to get a quick pulse on what students understand and what topics might need further review. They are also ways to inject some active engagement into the normally passive environment and could be used in a hospital setting.
- School is not compulsory.
- Online experts act as mentors.
- Most learning involves problem-solving and collaboration.
- Informal learning is valued as much as formal learning.
- Learning spaces foster relationships between people of all ages.
- There is greater community and culturally-based learning and information exchange.
- The curriculum is organized around spaces rather than subjects.
- Learning spaces are part of ‘hubs’ enabling diversity of people, resources and community input.

Ultralab also proposed **future scenarios** that offer models of “ubiquitous, ambient and persuasive technologies” that can be created anywhere and cater for differentiated learning and individual learners:

1. *Personalised pods* where learners have their own work space with apt tools and technologies to assist their writing, researching, publishing and communicating.
2. *Workflow areas* that are zoned around types of activities – e.g. for research, ideas development, production and presentation.
3. *Learning landscapes* where individuals place media files containing images, text and audio-based ‘livelinks’ that play on personal devices of passers-by (by pointing their portable devices at objects in the environment). The information could include local knowledge, local history, and personal narratives.
4. *Touch screens* that are also work surfaces, fully-interactive and linked with personal devices and function as screens for video-conferencing with others.
5. *Disused space – new place* that can be quickly re-organised and linked to the local community through wireless networks to promote a sense of community development and awareness of local environmental issues.
6. *Mobile production hubs* – ‘vans’ with wireless connection and inbuilt digital production and editing suites are parked in available spaces.
7. *Augmented reality* merges real and computer-generated worlds.
8. *Virtual reality* enables users to interact in computer-simulated and immersive environments.
9. *Transporta-cabin* – an experimental experiential mobile (within a designated area) cabin serves as a showcase and a sanctuary for learners. Its focus is to transport the learner enabling them to escape and simulate environments not normally accessible and stimulate the senses.

(Paraphrased from *what if…?* Rudd, Clifford, Morrison and Facer – Futurelab, 2006)

**The contribution of the Arts in health care – some suggested models**

Gund and Dorsten (in Rickes, 1997) saw art as part of, not outside, intellectual and creative life and part of the mainstream of education. They believed that leaders could provide a vision for the place of the arts in their institution and this in turn would influence spatial design.

Gary Chard (2003), Director of the **Awesome International Children’s Arts Festival** (in Western Australia) is dedicated to introducing young people to a range of contemporary arts experiences that aim to enhance, promote and celebrate their individuality, expand their arts language and introduce them to the process of making works of art that communicate messages about their worlds. He described *Artshed*, a space that focussed on engaging young people. In it, contemporary artists worked in different mediums over 14 days in what they called an arts factory. Young people visit the space regularly [and repeatedly] as the projects developed, talked to the artists, found out about the processes and learned more about the arts community. He believed this model helped to overcome artists’ reluctance to spend time working with young people. Chard’s aim was to attract young people to visit and engage because they want to, but realised that because adults usually acted as gatekeepers, the
program needed to attract both audiences. ‘Awesome’s’ work with students centred on their own way of expressing themselves.

A project of the City of Melbourne, ArtPlay, where children and artists had the opportunity to get together and imagine, explore and create art offers another model that could be taken up elsewhere. Eco-Cubby, part of this project, offered an opportunity for young people to meet with architects to workshop how a practical and build-able design would consider function, shelter, materials and resources.

Jane Vytrhlik (2003), of the Powerhouse Museum, Sydney, saw the museum’s hallmarks as interactivity and integration and showing the influence of human creativity in the sciences and the arts. She saw the museum’s role as emphasising the lifelong importance of ‘the real’. The high-tech and design-based museum is increasingly mounting exhibitions with children’s interactive activities, even though they are ‘messy’. She explored the reasons why the Star Wars exhibition was their most successful. The museum allotted visually attractive, dedicated ‘safe’, free space within the museum for 6 weeks. It catered for different ages, and the content linked to the exhibition’s content. The content created the inspiration for the children and parents to talk and they could take away the products they made. Vytrhlik believed that the museum staff needed to teach parents as well as teachers how to use the museum.

The Light in Winter, Melbourne’s Federation Square’s annual winter program celebrating the importance of ‘light’ in our multicultural community, offers another model for involvement in the arts that is not classroom-centric. In 2010, a large-scale major work by world-renowned artist Raphael Lozano-Hemmer was exhibited in the square. An associated education program was designed to support themes of ‘cultural origins’ and ‘light’ through student engagement in tour-based activities. The program began at an Indigenous campfire installation around which experienced Indigenous educators engaged students in activities such as traditional stories of the area around Melbourne, traditional music and dance. A facilitated tour of ‘Light in Winter’ artistic installations then led students around Fed Square. Activities included didjeridu playing, storytelling, Indigenous history, the story of Melbourne, Indigenous dance, and Dreamtime storytelling. Online activities and resources were provided to visitors prior to and following each tour.

A hospital-specific take on the National Gallery of Victoria’s Artie Mouse could take families on a tour of the hospital’s spaces and artifacts. Parents could participate in creative adventures that reveal hidden treasures, and an opportunity to express themselves in a workshop could follow, e.g. making cut-out or constructed art pieces or sculptures, performing on stage, painting faces or decorating bodies in a ‘body art studio’ (http://www.ngv.vic.gov.au/). A web page offering virtual travel and visual artworks could be created. Photos with descriptions of what can be discovered in different places around the world could be posted. (See www.art-mouse.com/)

All the models described above could be adopted and incorporated in or as learning spaces elsewhere.

**Learning in out-of-school environments**

Both Howard Gardner (theorist) and Mary Featherston (designer) believe that a good museum provides a great model for education because of its interactive, self-directed, inquiry- and problem-based learning opportunities that focus on ‘real’ things that remain at the core of the learning experience. Lord and May (in Rickes, 1997) believed museum pieces help people understand the world around them and can be used for display, study, or the education of the viewer. They recommended that institutions re-examine their historical and cultural assets and prepare a clear vision of the role of its artifacts.

For example, significant artworks may be in secluded places, historical apparatus, photographs and other memorabilia could be in storerooms. Rather than just being displayed, an instructive program that explains the objects could be put in place so that the collection becomes an interactive and living
educational force. This might include open storage, study nooks and multi-media or on-line databases and activities. Many of the staff will be unlikely to be familiar with using objects as tools of inquiry and will need opportunities to think about ways of creating opportunities for patients and visitors to interact with the “collection”. In this way the hospital becomes a place of inquiry. Temporary displays or lectures on aspects of the collection will involve the community. An out-of-school example follows:

The Kenyon College Book Shop in Gambia, Ohio, USA, provided a spatial model that could be established within a hospital. It found that when it used stuffed grizzly bears, tents and canoe paddles to promote its camping section, children crawled into the tents to read books and used the stuffed bears as couches. Away from quiet areas it had a lounge area with couches and large windows that looked over a garden area, a newsstand, café, and convenience store. They found it had become an intellectual community centre where students wrote essays or played chess. This space is not unique – there are many similar spaces in the community today. They are both profitable businesses and intellectual and social successes. They are places where staff and students can read, eat, talk, relax, listen to music, and mix. Such places in institutions associated with young people bristle with activity and tolerate the “boisterous irreverence” of the students (Finefroack, in Rickes, 1997, p. 105).

The outdoor environment

Apart from offering shelter when needed, the design of outdoor facilities can support the needs of all students through the provision of equipment and resources that meet social, recreational, learning, fitness, and quiet reflection requirements.

The landscape is the first thing people see when entering an institution. If guidelines and standards for the best arrangement of spaces, circulation, and plantings keep in mind the institution’s mission and history, it can provide a serene and sensory experience. It can also augment the institution’s educational program as well as providing positive visual memories for its occupants and visitors.

If students are to be consulted about the landscape, then asking them questions about their environment that they can comprehend are essential. Evans et al. (2007) found that the children in their study of students’ environmental attitudes found they had strong pro-environmental attitudes but not necessarily behaviors that were consistent. The researchers’ methods of obtaining attitudes were interesting. They designed a felt board on which children displayed scenarios, they created a board game with either/or choices and they had a worry thermometer on which levels of concern could be recorded.

Outdoor areas need to be well maintained, feel safe, and enable a range of activities. In a hospital environment, outdoor areas that resemble a park, could, for example have built-in games or clues to puzzles they have been asked to solve. Obviously ramps, paths and access must accommodate wheel chairs etc and hard surfaces may be required for this. Faber and Kuo (2008) when describing how ‘nature’ improved concentration levels of children with ADHD identified helpful features that could be integrated into indoor and outdoor spaces:

1. Accessible natural amenities like trees, flowers, open lawn, small bushes [and vegetables].
2. Natural amenities like aquariums, terrariums and indoor plants.
3. Windows with views to nature.
4. Sitting or perching walls that accommodate more people and avoid clutter.
5. Outdoor rooms of grass (even if synthetic) and wildflowers (low maintenance) to enhance well-being.

Outdoor and environmental considerations need to be embedded in teacher education to ensure they remain on the ‘radar’ during educational discourse.

Access to external spaces and resources expands the range of active learning opportunities available to stimulate imagination and the development of social and motor coordination skills. Therefore, the connectivity between indoor and outdoor learning spaces should be fluid and conducive to exploration and activities in small or large groups.

Complementary indoor and outdoor learning environments diversify in the range of resources that students can use to demonstrate play-based learning, team work, social networking, authentic inquiry and physical fitness.

Teachers, students and support personnel have ready access to a variety of resources so that students can demonstrate learning in different ways.

Uptake of notions of moving into learning spaces by the education professions

Organisational impediments need to be addressed if the desired teaching and learning strategies are to be embedded across a school. Ongoing transfer of information and communication of changes in practice will be required. A timeline for change (in years) should be established.

In order to facilitate appropriate flexible designs and enable the new spaces to operate to maximum capacity, the processes that ensure appropriate consultation occurs, and the learnings that the RCH community requires, will need to be understood and followed.

Roles and responsibilities will have to be assigned to leadership groups and teams of staff members at appropriate times – before, during and after the shift into the new spaces. It is important to establish appropriate multi-disciplinary clusters as part of new organisational structures.

The designers, policy makers and educators who understand and manage the pedagogical and spatial changes should accept responsibility for communicating strategic initiatives, and report on other cases and progress. Leaders and those involved in facilitating the change process need to be aware of the issues that are surfacing as a result of the changes occurring and how they will work towards a resolution if the need arises. Constant monitoring of, and adjustments to, organisational structures, curricula and technologies will be required.

Changes to and occupation of school learning spaces should be driven by the users in consultation with the designers and be embedded in pedagogy.

DEECD’s Performance and Development Culture Revised Self Assessment Framework (Draft, 2009) is relevant for the performance of leaders’ activities that procure learning environments from the macro to the micro. Four elements of the Framework are associated with linking pedagogy and space, viz: Induction into a new role, multiple sources of feedback on practice, individual performance and developmental plans aligned to goals, and quality professional learning.

Stimulating engagement in learning by others

All educators would like parents to be involved in their children's education and help with the development of school-based programs, extra-curricular activities and the reinforcement and extension of academic learning at home. The literature offers little on parent involvement in children's education in a hospital setting, but Tiffany and Young (Cornell University’s Family Life Centre, Ithaca, NY, http://www.actfortheyouth.net/documents/prACTice_Aug04.pdf) stated that human service and health care providers want parents to understand the interventions they offer and how to support their children when they access programs. Educators have the same desire.

Tiffany and Young offered some keys to successful parental involvement in education, for example: allow time for parent involvement efforts to take root; develop parent-to-parent peer programs; and
invite parents to young person-centred events. Some suggested events and involvements have been put forward elsewhere in this paper.

The ‘Raising Children Network’ outlines the importance of parental involvement in education (http://raisingchildren.net.au/articles/involving_parents_in_school_and_childcare.html) and found that interaction between teachers and parents helped with the child’s development and wellbeing and the way this happened had a major impact on how parents related to educators and the organisation to which they belonged. To stimulate engagement in learning, educators could tell parents about the aims of their learning setting, ask the parent about their child’s interests and strengths, their expectations of education and the kind of information they feel would support them as parents, and also suggest specific ways they might become involved.

According to Brown (http://www.kidsource.com/kidsource/content2/Involving_parents.html), research has shown that when parents participate in their children's schooling frequently, it: enhances the children’s self-esteem, improves their academic achievement, improves parent-child relationships and helps parents develop positive attitudes towards, and better understanding of the schooling process. Simple tasks can be shared by parents, carers and the child, e.g. watching a DVD together or going on a problem-solving trail looking for visual or physical clues and completing associated tasks set by an educator.

Greenberg (1989) stressed that parents could feel uneasy if their cultural style or socio-economic level differed from those of the teachers. Some parents may not understand the importance of parent involvement as outlined above, or may think they do not have the skills to be able to help. Even parents who are confident and willing to help may hesitate to become involved for fear of overstepping their boundaries. It is therefore the responsibility of teachers and administrators to encourage parents to become involved through non-threatening activities and welcoming physical settings. This would seem particularly important at stressful times when the hospitalisation of a child is involved.

Smith (2001) noted that barriers to communication with and involvement of parents included: educational and spatial jargon (e.g. differentiation, collaboration); the meaning of statistical analyses; lack of understanding of the system (e.g. some parents may be reticent to assert their opinions with professionals); and logistical problems (e.g. lack of transportation or child-care, work or other responsibilities). He believed that when viewed as a promoter and supporter of the child and family, an educator became a valued invited guest and not an adversary.

When developing goals and objectives in a special setting, it is crucial that parents, advocates, and students share their expectations about the student's future participation in schooling while in care, at school, or in the home. At the same time, it is important for educators to indicate which objectives parents or carers can help teach or reinforce at home. Whether they are in a regular education classroom, self-contained area, home or hospital, the opportunity for the student to participate in 'typical' school experiences with peers as much as possible should be an aim.

It is important to identify strategies to ensure that future communications with parents are ongoing and collegial in order to maximise the benefits of the program for the student. Today, ICT facilitates communication, but community users may well need technical assistance. The provision of welcoming, stimulating, hands-on spaces that both young people and parents want to visit is vital. Active participation assumes there are suitable places for this to occur and that the parents and carers are supported.

Cognisant of the transformation occurring in education in the new millennium and aware that it takes more support than putting computers into schools or funding school construction, Microsoft launched an Innovative School Program in 2007 (http://innovativeschoolsonline.com. Accessed 21/5/2010). Following a pilot program in 12 schools from around the world, it developed a 6i tool to help schools systematically reflect on, plan and implement a vision for reform (Fullan, 2007; Elmore, 2004). It was
not prescriptive, but its six processes were designed to assist optimal innovations for local contexts and specific needs. The phases were:

1. Introspection
2. Investigation
3. Inclusion
4. Innovation
5. Implementation, and
6. Insight.

The 6is tool was based on the belief that effective leaders do not merely disseminate a completed vision and plan to their school community but rather, they “mobilise, listen to and engage a highly talented and motivated constituency of people who contribute to building and enacting the vision” (The 6i Process, p. 8). A focus of the Inclusion phase of change was for leaders to develop strategies for building support for the change through partnerships beyond the school.

Fullan (2007) found that as additional stakeholders become involved, a school’s vision matures and evolves, and this process takes time. As well as engaging teachers in the vision for change, gaining support from parents, community and business partners is considered vital. As well as face-to-face meetings and seminars, online information, sharing through blogs, and teleconferences all contribute to communication. Inclusion means schools take the opportunity to develop collaborative relationships and feedback mechanisms with the larger community and to further develop their vision for change with the help of these partners. [http://innovativeschoolonline.com/WhitePapers/6i_inclusion.pdf](http://innovativeschoolonline.com/WhitePapers/6i_inclusion.pdf), Paper 4, p. 9. (Accessed 21.5.2010).

Thinking Space is a workshop resource from CABE (Commission for Architecture and the Built Environment, Futurelab and Portsmouth City Council, UK, [www.visionmapper.org.uk/pdfs/download.php?file=thinkng-space.pdf](http://www.visionmapper.org.uk/pdfs/download.php?file=thinkng-space.pdf)) that supports people who are currently undertaking the redesign, rebuilding or occupation of new spaces. It provides sets of activities, tools and techniques that can be used to facilitate workshops that assist people in the visioning and pre-engagement phase of projects. Apart from activities for practitioners it offers activities that can be undertaken with students and the wider community to involve them in the process. For example:

1. ‘Stakeholders’ consider organisations, institutions, companies or initiatives that have aspects of principles they might identify with. Rank these in order of importance, then consider what a learning space that reflects these principles might look like.
2. Consider developing an image gallery or an online photo management resource where images can be uploaded and comments received about interesting designs or approaches engagingplaces@cabe.org.uk.

Social network analysis (Penuel, Krause and Frank, 2009) can yield a picture of the critical players in transferring expertise within subgroups of a school and its community. Given the dynamic nature of schools strategies will need to be adapted to pressing needs which can include professional development, technological issues and governance structures.

**Effective communication of the learning environment with the community**

According to the Design Council, UK, (2005) community involvement is both the cause and effect of an improved learning environment. Effective communication by educational institutions has the dual responsibility of presenting their programs positively and promoting links with, and understanding
among, parents and other community groups. The needs and perceptions of users and visitors vary, and improved communication has a role to play in understanding and catering for competing priorities.

Both physical and organisational structures influence communication. With the provision of new infrastructure, educators need to consult with students, parents and the wider community. This includes: clearly written information and understandable plans (e.g. axonometric), white and interactive boards on which to post comments, information sessions for users and visitors that display easy-to-read plans and allow time for discussions about pedagogical implications, and electronic notice boards etc which constantly update information about activities and ways people can be involved. Hopefully buildings will have salient features and ‘landmarks’ that make them navigable and signage to cover foreseeable and acceptable movement around the spaces. Plans of spaces that can be transformed into readable geometric forms are vital (The Commission for Architecture and the Built Environments, UK - CABE).

Principals recently involved in new learning spaces were asked at a DEECD symposium for their recommendations for involving the community. They suggested:

- Erect a building bulletin somewhere the community will see it.
- Hold strategic ‘Showcases’ of the new spaces being used.
- Explain to the community about the changes to pedagogies, ICT, team teaching etc in the light of 21st Century teaching and learning requirements.
- Hold morning teas, etc, for parents with a focus question about the new spaces.
- Nominate tour dates for the community.
- Demonstrate how you listen to the students’ and their voices.
- Showcase the products of the students’ engagement.

The term ‘community orientation’ relates to spaces in a school that accommodate both learners and different sections of the community. They can include resource centres and play an important role through the access they provide.

**Evaluation of learning spaces and learning outcomes**

Fisher, an Australian learning spaces expert, writing on the impact of school infrastructure on student outcomes and behaviour for the Australian government’s Department of Education, Employment and Workplace Relations publication, reviewed a range of studies that examined the possible causal linkages between building design and student learning outcomes (http://www.dest.gov.au/sectors/school_education/publications_resources/schooling_issues_digest/schooling_issues_digest_building). He concluded that, in the USA, although rigorous and sound empirical quantitative research had been conducted, more was required to fully validate the findings. In Europe the findings had been more based on qualitative studies. Taken together, the research was indicating that student academic achievement improves with improved building conditions but that new and emerging trends in education settings’ planning and design and their impact on student outcomes and behaviours have yet to be fully evaluated. The study also included: measuring building conditions; student outcomes and behaviour; building conditions (including age of the facilities) and the relationship to student outcomes and behaviour; individual building elements and their relationship to student outcomes and behaviour; and design factors that can influence learning outcomes and behaviour.

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14 Innovative Learning Environments Seminar, Principals and Regional representatives invited by Lynne Sutton, (a senior manager, DEECD) to discuss issues arising out of the occupation of new learning spaces, Melbourne, March 26, 2010
In 2002, Schneider had examined research into similar areas to those explored by Fisher, stating that those involved in school planning and design saw it as an opportunity to enhance outcomes by creating better learning environments. He concluded from his substantial literature search that school facilities affected learning, that a building’s age should not be used as a predictor of impact on performance, that there is a consensus about the positive effects of small school size which seems to be stronger for students in low socio-economic areas, and the size of the class is not necessarily a determinant of learning outcomes. The quality of the research he described ranged from anecdotal to a few larger studies and there were disagreements over methods used.

In a small study, Weinstein (1977) observed the spatial distribution of activity in a junior primary shared space before and after a change in the physical space. Her intention was to test the hypothesis that changes in the physical setting could produce predictable, desirable changes in student behaviour. The activities and locations of students were recorded on a floor plan of the room. Specific behavioural goals were stated and a two-week post spatial change observation showed that in most cases the desired changes were achieved. Her study provided a ‘neat’ method that individual teachers could use to measure small-scale “success” – ie, select one or two desired behaviours and look for their presence before and after the occupation of a new or refurbished space. The behaviours observed could be social, physical or technical skills.

The University of Melbourne’s staff involved in the Smart Green Schools project (2008-2010) have observed small- and large-scale moves into new spaces over three years. Teachers in a school that had undertaken a large scale building program which included ‘schools-within-schools’ and had occupied the new spaces for a semester, were asked about whether they had observed modified student behaviour (28/1/2010):

Q. How have the students responded to the new context? In interviews students have told us they liked the creativity, collaboration and decision-making.

A. There are almost no trouble-makers because the ‘audience’ for kids who want to “play up” has gone thanks to the spatial configurations.

A: Student management issues have virtually disappeared within the new buildings.

A. The students are now treated and respected as individuals. They are connected to Houses within a Schools Within Schools and seem to be emotionally settled and ready to learn. The relationship between students and teachers is much closer. There is harmony. It is something to do with the students, the teams of teachers and the space.

Q. How has student engagement been affected?

A. The kids love to hang round the new spaces. They want to stay there during breaks and after school. The handy access to teachers assists this.

Q: There seems to be few, if any, space usage rules. Would particular patterns of behaviour being required in spaces change ways of working?

A. We have found that if the students feel comfortable in the environment they are in they settle down without rules AND their work ethic improves.

These anecdotal comments appeared to support research findings.

The current data available from Victoria’s DEECD administered ‘Attitudes to School’ survey in the school have already shown that student engagement for Years 7, 8 and 9 at this school has been

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15 Publications on pedagogies and space written by the ARC Linkage Grant, Smart Green Schools project team include Take 8 and Critical and Creative Thinking (See references).
outstanding in connection with the learning context. All Victorian schools are able to use this measurement tool.

Other ‘raw’ ways of measuring success, again in behavioural terms, would be to check whether there has been a reduction in disruptive behaviour, the number of detentions and suspensions, the number of absences, vandalism, lateness, and other penalties metered out prior to and following the occupation of new spaces.

It is important to ascertain what outcomes can be attributed to new pedagogical practices and learning spaces. Designers (architects and interior) need to be involved in ongoing post-occupancy evaluation – not just the evaluation that occurs shortly after occupation. There will be design elements that have not been successful or need to be altered in some way.

Ongoing systematic pedagogical post-occupancy evaluation in terms of outcomes of student performance is important. It is easier to judge whether improved thermal factors and spatial designs have contributed to wellbeing, attendance etc, than to put a numerical score on improvement, although the latter has been attempted (Schneider et al., 2002). Outcomes for students will need to be measured via existing and specially designed measurement tools. It will be vital to seek expert advice concerning measurement tools that will provide the required pedagogical and environmental data. How and when this occurs, and by whom, will need to be decided during the establishment of the timeline.

Teams of staff members will need to be encouraged to re-evaluate their beliefs as they practice new pedagogies and occupy altered or newly configured and equipped learning spaces. It will be necessary to find appropriate tools to monitor the performance of the users as they undertake the new pedagogies and teaching practices as well as the extent to which the spaces are being used effectively by both teachers and students. Outside expert advice and critical friends can be employed for this important process.

Ways of measuring the performance of spaces in line with department and governmental guidelines, internal and external policies and standards – including environmental sustainability - will be required. This will be either by the use of existing tools, or, if no suitable tools exist, formulation of new methods of evaluation. Further professional development will be required to carry out this process. The British Design Council recommended in 2005 that policy makers need to summarise the lessons of the past for various audiences, for example, architects, designers, construction firms, regional offices, teachers and the wider community.

**Government education policies on the creative use of spaces: the Victorian context**

The issue of creative use of space for learning has been considered by governments. This penultimate section provides a brief overview of policy-relevant activity in the Australian state of Victoria.

The Victorian DEECD has explored and published on the leading practices adopted by schools and teachers in their quest to improve students’ learning outcomes and identify and respond to student learning needs. Their *Pedagogies and Space* publication includes the design of spaces for 21st century learning, appropriate pedagogies, and students’ learning needs.

DEECD’s Leading Schools Fund initiative aimed to transform teaching practice and improve students’ learning outcomes by investing in additional teachers, accessible ICT and learning spaces. In *Transforming the Learning Experience*, the findings of government investment in the Leading Schools Fund initiative were synthesized into eight key variables characterising transformation (in a Transformation and Development matrix), the central element was found to be teaching and learning. It was believed that a strong focus on all the variables was essential for schools to achieve sustainable whole school transformation and evidence of innovative and student-centred learning.


The federal government through the Curriculum Corporation released its *Learning Spaces Framework: Learning in an Online World* in 2008. The framework was designed to guide high-level strategic decision-making in jurisdictions and schools. It provided advice on key issues to consider when planning new schools, refurbishing or repurposing physical and virtual learning spaces.

**Conclusion**

Aligning the concept of built pedagogy (Monahan, 2002) with contemporarily accepted educational theory for the creation of modern learning environments can support young people to become better prepared for the ever-changing global society of the 21st century. Further aligning these spaces with new forms of spatiality will enhance the likelihood that children and young people will become more engaged as active participants in their own learning and that learning for each individual can become more authentically personalised and equitable.

By making the time to engage in discourse about the spaces in which students learn, and working towards the creation of equitable pedagogical spaces (Cleveland, 2009), schools and educators may be better equipped to cater for the diverse interests and capabilities of the students in their care.

The limitations of this literature review are that, due to its scope, it has incorporated views and evidence from multiple sources, sometimes with little depth while design issues are rooted in particular contexts that need to be expanded to be fully understood. However, it concurs with a literature review commissioned by the Design Council, UK (*The Impact of School Environments*, 2005), that is, that the evidence is unequivocal with regard to the importance of user engagement in defining and solving individualised and local problems in education spaces - the Council (2005, p. 37) concluded that the most successful learning spaces are likely to be those that have within them “elements of flexibility and adaptability for new cohorts of learners and teachers, new curriculum demands and new challenges”.

Whilst this review has also brought together the concepts of personalised learning, flexible, innovative learning spaces with access to technology as a portal in the wider world, it has identified a shortfall of evidence in the international literature that a) embodies these concepts in relation to the occupation of new hospital spaces; b) harnesses the opportunities provided by a new hospital building as a catalyst for the enjoyment and engagement of learning for children and young people; and c) that incorporates the value of creating access and opportunities to parents and health professionals as partners in children’s learning.

The Charter for Children’s Learning at the Royal Children’s Hospital research project will address this gap.
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