INSIDE SCHOOL DESIGN:
The role of interior design in cultural change

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Doctor of Philosophy (Design)
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In fond memory of Trina Parker, an inspirational designer and mentor.
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Very special thanks to my family Kay, Graeme and Tabitha and my extended family Rosalind, Kate, Pete and Reny for their love, support and encouragement. Special thanks Rosalind to for her detailed proof reading of the final draft and to Buster my exercise enforcer. Finally, and most of all thank you to my husband Angus Smallwood for his unwavering support, encouragement and immeasurable patience and to our son Alexander for his wonderful cuddles and kisses that kept me going.
ABSTRACT

Current international education reform, manifest as a cultural shift away from the transmission of information towards the co-construction of knowledge, skills and understanding, is being driven by brain science and education research that describes learning as social, situational and experiential (Bransford, Brown & Cocking, 2000). In school architecture and interior design this shift is expressed as a rejection of teacher-centred cellular classrooms in favour of purposefully designed, child-centred learning neighbourhoods. A rapidly growing body of literature focuses on the emergence of new architectural design patterns for learning neighbourhoods (Dudek, 2000). However, little attention is being paid to the interior design of learning neighbourhoods or how interior design can be used to shape learning experiences and influence cultural change (Taylor & Preston, 2006).

This research uses case studies of four learning neighbourhoods to develop understandings about how interior design works in learning environments that have been specifically designed to promote pedagogical innovation and cultural change (Stake, 2010). Photographic observation, semi-structured interviews and visual analysis were used to identify children’s and teachers’ patterns of activity and behaviour. These were compared with the patterns of activity and behaviour nominated by the school communities as indicators of desired cultural change. The key finding of the research is that purposefully designed learning neighbourhoods do shape learning experiences, but because interior design is not well understood by school communities, teachers are not able to exploit the full design potential of their neighbourhood environments to positively influence cultural change.

The outcomes of this research are a suite of graphic tools that have been used to document a pattern language for school interiors, which articulates the relationship between pedagogy and design (C. Alexander, Ishikawa, Silverstein, Jacobson, Fiksdahl-King & Angel, 1977; Fisher, 2005a). This pattern language is a store of information that school communities and design professionals can use and contribute to. For school communities this pattern language provides guidance on the effective use of neighbourhood environments that will assist teachers to develop the environmental skills to confidently and positively influence cultural change (Martin, 2002). For design professionals this pattern language makes available new interior design patterns that will help them translate grass roots design innovations into mainstream school design. This pattern language also addresses the communication gap that exists between school communities and design professionals by developing a common language that enables more meaningful conversations resulting in more effective design briefs for better functioning schools (Lackney, 2009).
DECLARATIONS

This thesis does not contain any material that has been accepted for the award of any other degree or diploma. To the best of my knowledge this thesis contains no material previously published or written by another person except where due reference is made in the text of the examinable outcome. Where this thesis draws on joint research or publications the contributions of other researchers and authors is disclosed. Where this thesis draws on published work it is appropriately identified and its prior publication is acknowledged.

Kellee Frith, 16 September, 2015

The professional editing service given for this exercise has been mainly limited to basic proof reading of the thesis. This means that the focus was on adjusting grammar where required, fixing spelling mistakes, identifying missing words or misplaced words and occasionally re-arranging a sentence for clearer readability.

There has been no attempt to change the meaning in any sentence or paragraph, or to re-arrange an argument or a line of thought. The editor has no background in this topic and was quite unfamiliar with the topic and the material presented in the thesis, and was only concerned with minor corrections of a technical nature for the sake of a smoother presentation to the examiners.

Peter Haffenden
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Rachel is a Years 5/6 teacher at a suburban state primary school in Victoria, Australia. She teaches in a refurbished 1970s school building in a semi-open plan space that is an example of a new design pattern for school learning environments described and promoted by Victoria’s Department of Education and Early Childhood Development (DEECD) as ‘learning neighbourhoods’ (DEECD, 2009j). The interior design of Rachel’s neighbourhood is a radical departure from the traditional classrooms that the building once contained. They have been reconfigured as a network of interconnected and purposefully designed learning settings. As an organising concept the purpose of learning neighbourhoods is to integrate specialist facilities and general learning areas within the same environment. This is so that children and teachers have unrestricted access to a wide variety of learning settings as venues for diverse hands-on experiences. The size, arrangement and ambience of each setting in Rachel’s neighbourhood, together with the lighting, furniture design, and integrated tools, materials, resources and technologies are all calculated to foster collaborative learning and working relationships among a mixed cohort of 110 children and their team of five teachers.

Rachel’s learning neighborhood is a product of twenty-first century demands to develop new types of learning environments in response to international education reform, which has been described by education theorists, including Howard Gardner, as a shift away from traditional modes of transmission education towards social constructivist inspired pedagogies. Developed and designed by her school community in collaboration with an interior designer the specific intention of Rachel’s learning neighbourhood is to promote cooperative relationships between children and teachers, and facilitate child-led learning investigations conducted by communities of children working together. As well as being a concrete demonstration of a shift away from the cellular design of conventional classrooms and the behaviours they foster, Rachel’s neighbourhood is a rare example of the considered use of interior design to promote new pedagogical practices and a new
culture of learning. It is also one of four learning environments that were the focus of an investigation into the potential role that interior design can play in supporting the development of new cultures of learning in primary school learning neighbourhoods.

This research was framed by an Australian Research Council (ARC) linkage project, The School: designing a dynamic venue for the new knowledge environment. It examined the move, over the last decade or so, towards collaborative student focused learning that has seen the proliferation of new school architecture and with it, controversy about the effectiveness of new school interiors and the day-to-day function of the learning environments they promote. Grounded in an assumption that interior design has a significant role to play in influencing children’s and teachers’ school experience, the intention of the ARC project was to evaluate how the interior design of physical learning environments, such as Rachel’s, can advance or impede the processes of learning and teaching. Its aims were to investigate a collaborative model of practice for school interior design and the possibility of constructing principles and guidelines to assist education and design communities in the design and redesign of school interiors (Barron, Featherston & Whitehouse, 2006).

Two Victorian schools were selected as research subjects: Bialik College, a private fee paying school in inner suburban Melbourne and Wooranna Park Primary School, a government funded school in a disadvantaged outer suburb. These schools were chosen because of their influential pedagogical innovations and their decision to work collaboratively with interior designer Mary Featherston to research and develop new interior design languages that would enable them to achieve cultural change. Simply expressed, both schools sought to develop new learning environments that would support a shift away from teacher-driven instruction to child-led investigation and discovery. The focus of this research was on the Preparatory (Prep) and Year 6 neighbourhoods at Bialik College and the Prep and Years 5/6 neighbourhoods at Wooranna Park Primary School.

Featherston is significant as one of few interior designers specialising in the design of learning environments. Her collaborations with Bialik and Wooranna were products of a long-established, rigorous and research-based design practice. As a functionalist designer, Featherston prefers to design ‘from the inside out’ (Featherston, 2006). That is, she researches the needs of users, in this case school communities, to understand their activities and practices, and what they need in their environment to support them. The results of her collaborations with Bialik and Wooranna have become landmark examples of the intimate relationship that can be achieved between pedagogy and the
designed environment. They are also rare examples of contemporary learning environments developed using collaborative design processes. Featherston and the school communities have also developed a significant body of research into the contemporary needs and wants of school communities.

What is Design?
The focus of this thesis is on the interior design of school learning environments, which is neglected within the current school design reform movement. Partly because conventional procurement procedures for new school buildings are exclusively concerned with architectural design (DEECD, 2009d), but also because of a general lack of understanding of how design, particularly interior design (M. Taylor & Preston, 2006), influences the daily practices of learning and teaching. In 1995 renowned design historian Adrian Forty lamented that:

Most of the literature from the last fifty years would have us suppose that the main function of design is to make things beautiful. A few studies suggest that it is a special method of solving problems, but only occasionally has design been shown to have something to do with profit, and even more rarely has it been seen as being concerned with the transmission of ideas (Forty, 1995, p. 6).

Since then television programs dedicated to home renovation and building projects, most notably Kevin McCloud’s Grand Designs, suggest there is growing popular interest in the design of built environments. Within design literature authors, such as design historian Penny Sparke (2004a), have successfully argued that the elements of interior design, including colour, form, texture and use of materials, are employed by interior designers to invest meaning in built environments. Sparke (2004b) also argues that interior design is used to shape individual and collective identities, but despite this the function of interior design and the role of the interior designer are still not generally well understood.

Interior design literature suggests that there are two reasons why this might be the case. The first is that interior design is often confused with interior decoration as an expression of fashion and style (Taylor & Preston, 2006). The second is what Sparke describes as interior design’s “ambiguous relationship with architecture, which has both ‘owned’ and ‘disowned’ it at different historical moments” (2004b, p. 2). There is also confusion between the practices of interior design and interior decoration. As Sparke’s (2005) investigation of American interior decorator, and author of The House in Good Taste, 1913, Elsie de Wolf demonstrates the purpose of interior decoration is to humanise built environments and to express the character and taste of the people who live and work in them. Its means of expression are the colour of paint, the patterns of wallpaper, the line
and form of furniture, the ambience created by light fittings and lamp shades, and the weight and texture of carpets, curtains and upholstery fabrics. De Wolf used these decorative techniques to transform the dark, heavily draped interiors of the Victorian period into light, bright and uncluttered environments for living in that expressed her clients’ identification with a different language of style.

Interior design is also able to express character, style and taste, but in contrast to interior decoration, its primary function is to shape human experience in built environments. Its focus is the organisation and configuration of space; the design, selection and arrangement of furniture; and the manipulation of light and shade to influence the manner in which people use, inhabit, and respond to different types of built environments. A low ceiling and soft lighting in the entrance to a building, for example, have the effect of drawing people into the larger, light-filled spaces within (C. Alexander, Ishikawa, Silverstein, Jacobson, Fiksdahl-King & Angel, 1977). The use of colour, texture and materials all contribute further to the ambience of interior environments and are used to direct people’s interaction with individual settings. For example, a softly lit restaurant dining room with warm timber wall panels, plush carpet, comfortable chairs and crisp white table cloths invites diners to take their time. Whereas the bright lighting, hard flooring, bare tabletops and plastic chairs of fast-food outlets are calculated to discourage people from lingering over their meal. Even the smallest detail of interior design shapes the way that people interact with their environments: in a restaurant the cutlery and glassware is on the table where it is needed, whereas in a fast-food outlet customers collect the utensils they need from service bays that are designed for speed and efficiency.

Dutch architect Gerrit Rietveld’s design for the Schröder House, 1924, Utrecht, Netherlands is an iconic example of De Stijl design that demonstrates a seamless relationship between architecture and interior design. Designed as a total system the two-story house gives the impression of a three-dimensional grid composed of rectangular volumes, and horizontal and vertical lines and planes. The lower floor comprises a kitchen and three standard rooms above which is a spacious, light-filled and largely open-plan living environment. The walls and ceiling are painted white and the floor and window frames are black. Rietveld used ready-made storage units, custom made furniture and large areas of flat colour—red, yellow, blue and grey—on the walls and floor to define settings and emphasise the grid. The most striking feature of his design though, is its system of sliding and revolving wall panels. This facilitated Mrs Schröder’s wish to be together with her three children in one living space, which they could reconfigure to suit their various activities throughout the day before dividing it into a living room and three bedrooms at night.
An important function of architecture and interior design is to communicate the purpose of built environments so that people know how to use them. Public buildings, such as banks, hospitals and libraries, are familiar architectural forms that communicate their cultural function as well as expected norms of behaviour through their design. Over centuries western architecture has created churches that, although different in their specific period style, all share particular features that signify a church. These features include the symbol of the cross; tall narrow windows; and strong vertical elements that reach heavenwards, such as spires, bell towers and steeply pitched roofs. These features constitute the architectural pattern for churches, which is instantly recognisable as a place of worship. The interior design pattern for a church is equally distinctive. Rows of pews arranged in straight lines on either side of a central isle facing the chancel area at front of the church. The spatial organisation and furniture arrangement of a church are behaviour cues for people to sit in the pews and direct their attention to the front.

Japanese architect Tadao Ando’s design for the Ibaraki Kasugaoka Church, 1989, Osaka, Japan disrupts the architectural design pattern for churches. His church is a windowless rectangular reinforced concrete box with a flat roof. From the outside only the symbol of the cross identifies this building as a church. Inside though it is immediately recognisable. Tiered rows of pews arranged in straight lines on either side of a central isle face forwards. A cross, cut through the thick concrete wall behind the chancel area from floor to ceiling and from side-to-side, is brightly illuminated with sunlight. The light reflected on the surface of the raw concrete walls creates an ethereal quality to rival that of a church with conventional windows. Ando’s Church of Light also embodies all behavioural cues of a traditional church in its interior design. The central isle directs people in to take their seats in the pews that are arranged so that the attention of the congregation is drawn towards the light. Ando has successfully re-imagined the architectural design pattern for a church using the symbol of the cross on the building’s exterior to communicate its function. His use of the familiar interior design pattern for a church ensures that people know what is expected of them once they are inside.
Thesis Outline

Just as Ando re-imagined the architectural design of churches, school architects and designers are reimagining the form and function of school buildings. New models for school buildings are being developed in response to international school building reform, which is fueled by an increasingly large and uncontested body of evidence that the cellular classroom is outdated and unsuitable for twenty-first century education. An examination of the research literature on school design, presented in Chapter 1, *Changing Patterns of School Design*, reveals that although a great deal of energy has been expended in testing and evaluating conventional school architecture, and in the development of alternative architectural patterns, there is little investigation of school interiors. Historically school design has been used to express attitudes and beliefs about the social function of school and the value of education (Burke & Grosvenor, 2008). It has also been used to influence and shape children’s and teachers’ interactions, activities and behaviours (Burke, 2005a, 2010a). Yet, little attention is paid to the capability of interior design to communicate expectations about learning and teaching practices (Burke, 2010a) or the ways that school interiors are shaped by the children and teachers who use and inhabit them (Lawn & Grosvenor, 2005).

Contemporary design exemplars of child-centred learning environments such as those designed by Featherston at Bialik College and Wooranna Park Primary School provide valuable insights into the function of interior design and the type of expertise an interior designer can bring to the task of developing new cultures of learning. These projects, which are explored in Chapter 2, *Designing from the Inside Out*, suggest possible models for collaborative school design practice. In particular they demonstrate how an interior designer works with school communities to construct environments that are physical expressions of new learning cultures (Hall, 1966). Featherston’s work with Bialik and Wooranna is part of a long tradition of collaboration between innovative educators and pedagogically aware architects that produced highly influential school designs including Larry Perkins’ design for Crow Island School, 1940, Winnetka, Illinois, USA, and David and Mary Medd’s design for Eveline Lowe Primary School, 1966, London, England, UK. Historical exemplars like Crow Island and Eveline Lowe, brought to our attention through the work of education historians, architects and academics, are providing new sources of inspiration for school architecture and interior design patterns.

Arguably there is just as much to learn from contemporary design exemplars like Bialik and Wooranna as there is from historical exemplars. The challenge was to devise a way to effectively study children’s and teachers’ school routines in physically complex and interconnected interior environments. The primary motivation for conducting this study
was to investigate the influence of interior design on shaping learning cultures, the secondary motivation was to document the interior design patterns identified in the case neighbourhoods. The systematic investigations made of the Prep and Year 6 neighbourhoods at Bialik and the Prep and Years 5/6 neighbourhoods at Wooranna, and the methods used are detailed in Chapter 3, *Looking for Patterns of Cultural Change*. The aim was to use the documents that constituted the design briefs for the learning neighbourhoods to build up a picture of the new learning cultures the schools were trying to create and compare that picture with the patterns of activity and behaviour observed in the case neighbourhoods. If the patterns of activity and behaviour matched the expected picture, an argument could be made in support of the role of interior design in changing the culture of learning. However, the patterns did not match and so the questions about the potential of interior design to foster cultural change in primary school learning neighbourhoods became more complex.

The research findings include detailed analyses of how children and teachers moved and how they organised themselves within their neighbourhood environments that are presented in Chapter 4, *Identifying Patterns of Cultural Change*. Significant differences between the design intent of the neighbourhood interiors and the ways that children and teachers routinely used and inhabited them highlight the tenuous alignment between learning culture and interior design. The research findings also include the interior design patterns identified across the case neighbourhoods which are detailed in Chapter 5, *Documenting Design Patterns for School Interiors*. The three neighbourhoods designed by Featherston, Bialik Prep and Wooranna Prep and Years 5/6, contained a large variety of design patterns densely layered to create multiple individual learning settings that clearly articulated their purpose and function. Whereas, the Bialik Year 6 neighbourhood, designed by teachers without design assistance, contained fewer design patterns and fewer learning settings with little distinction between them. There was a direct relationship between the number of design patterns identified in each neighbourhood and how supportive its interiors were of children’s and teachers’ activities.

The search for reasons why there was a mismatch between what was expected and the ways that children and teachers actually used their interior environments highlighted the fact that interior design is one of many in a complex web of interdependent influences, which are each critical to sustaining real cultural change. While pivotal, the part that teachers play in driving and sustaining cultural change is not well researched. The ways in which teachers were observed managing and manipulating their physical learning environment, as a pedagogical tool, to support and promote children’s learning activities are explored in Chapter 6, *The Third Teacher*. The teachers’ interactions with their
interior environments suggest that teachers have a role to play as designers building on the environmental communication established by Featherston. Chapter 7, The Third Layer examines the way teachers resourced and managed their interiors on a daily basis to suit their aims and engage children in a dialogue about learning. The findings of these investigations suggest that teachers need pedagogical support, time, opportunities and strategies for developing and sharing their environmental knowledge and design skills. The teachers’ practice of learning documentation may hold the answers. It may also hold the key to elaborating a pattern language for school interior design.

A review of the reports on the effectiveness of Australia’s open plan schools illustrates the importance of interior design patterns in supporting collaborative modes of learning and teaching. It also shows that Australia’s open planning scheme unsuccessfully adopted the design patterns the Medds developed for Eveline Lowe, revealing the critical importance of documenting and clearly communicating interior design patterns, including those identified at Bialik and Wooranna, so that they can be used in other schools. Strong parallels identified between Australia’s open planning scheme and the current Building the Education Revolution (BER) program also suggest the importance of documenting interior design patterns and ongoing interior design research in schools. Chapter 8, A Pattern Language for School Interiors explores the potential of a pattern language as a means of capturing interior design innovation and teachers’ experiences, like those at Bialik and Wooranna, and bringing them into mainstream school design. As discussed in Chapter 9, Beyond Cultural Change, the long-term aims of this study are to develop the research methodology and the pattern language further as aids to creating more effective design briefs for better functioning schools.
1.1 SCHOOL DESIGN AND PEDAGOGICAL CHANGE

Since the turn of the twenty-first century new school building and refurbishment projects in Australia, the UK, the USA, New Zealand and parts of Europe have given rise to new building prototypes and design patterns for ‘twenty-first century learning environments’ (Nair & Fielding, 2005/2013). Designed in response to widespread social and cultural change and learner-centred education theories, notably Gardner’s (1993/2006) theory of multiple intelligences, these new environments help redefine learning as social, situational, experiential, connected and continuous (Gislason, 2007, 2009; Jamieson, Dane & Lippman, 2005). This redefinition of learning as a collaborative endeavour is central to the education reform movement and captured in Australian and British government planning documents promoting community oriented school building and refurbishment programs (DEECD, 2009a, 2009c; Department of Education and Skills [DfES], 2004a, 2004b). It is also reflected in the discursive response of the architectural community, typified by Dudek (2000), Hertzberger (2008) and A. Taylor (2009), about what form twenty-first century school design should take.

Over the last decade architects have responded to the call for improved school buildings by developing a new architectural language as an alternative to the dominant pattern language of ‘the modern school’ (Burke & Grosvenor, 2008; Dudek, 2000). This is because there is widespread agreement that the cultural and pedagogical values embodied in its single-teacher cellular classrooms and double-loaded corridors are unsuitable for twenty-first century learning and teaching. At the heart of efforts to radically re-imagine school buildings are widely held tenets that built environments shape patterns of human activity and behaviour. These tenets are supported by architectural and cultural theory (Alexander et al., 1977; E. Hall, 1966) and environmental behaviour research (Moore, 1986; Scott-Webber, 2004) that has been used to suggest that new school architecture can actually drive pedagogical change (DEECD, 2008a; Fisher, 2005a).
Under considerable pressure from governments intent on architecture-led education reform, architects have been assisting school communities to revitalise their built environments to support cultural change and express the values of twenty-first century education. They have developed new architectural and spatial patterns, evident in school design templates and building publications, that are intended to reshape schools as collaborative environments for learning communities. The general trend, as expressed in the interior design of Rachel’s Years 5/6 neighbourhood at Wooranna, has been towards opening up existing spaces to create collaborative environments for co-constructing knowledge. This has led to the development of new spatial concepts, including learning streets, commons and neighbourhoods, resource centres, diverse learning settings, and technology hubs. Teams of teachers are bringing classes together in large learning communities and children are being encouraged to work in collaborative groups of various sizes. They are engaged in a wide range of ‘real-life’ learning experiences that are geared towards individualised learning, formative assessment, and encouraging children to take responsibility for “learning how to learn” (DEECD, 2009c, p. 2).

As external expressions of education revolution and school building reform, the architectural innovations, bold colours and striking graphics of new school buildings are attracting a great deal of attention, but not so their interiors. The design expertise being used to develop new architectural patterns is not being applied to developing new interior design patterns that might help shape the kinds of pedagogical practices and relationships associated with new modes of learning and teaching (DEECD, 2008b). As a result little attention has been paid to how to convert the interiors of new and refurbished school buildings into functional learning environments that promote hands-on experience, co-operative relationships, and a culture of collective knowledge building. Rather, as this chapter’s review of the literature will show, the new architectural pattern language, evident in school building templates and design guidelines, pays scant attention to the questions facing school communities about how spatial organisation, furniture arrangement, access to resources, integrated technologies, and the use of color, texture, materials, and light might enhance or hinder their efforts to develop alternative learning cultures.

This chapter examines the research literature to show that despite the attention paid to the function and development of architectural design patterns for schools, little is known about their interior design. Clues that might explain why are sought in the policy documents that accompanied new school building and refurbishment projects including Australia’s Victorian Schools Plan (VSP) and Building the Education Revolution (BER) and the UK’s now defunct Building Schools for the Future (BSF). The various reports produced by Britain’s Commission for Architecture and the Built Environment (CABE),
which have directly informed Australian reform programs, are also examined. But it is published literature from the USA that has been most influential in directing school design research agendas in Australia. American school architects including Anne Taylor, Peter Lippman, Prakash Nair, Randall Fielding and Henry Sanoff, and environmental behaviour researcher Lennie Scott-Webber have been particularly informative. As Australian academic Jill Blackmore (2011) points out the vast majority of the literature concerned with the design and assessment of school facilities originates from the USA. Logically therefore, Australian architects and education policy-makers have looked to the USA in their efforts to develop evidence-based school designs.

The absence of interior design from the research literature and from discussions about the influence of design in international education reform defines the research gap that this thesis seeks to address. As this chapter explains, there are many reasons for the neglect of the school interior. One is the entrenched and unchallenged design pattern for the ‘modern’ cellular classroom that signifies ‘school’ in Western education. Another is the long established practice of making separate funding allocations for furniture directly to schools. This breaks the connection between architecture and interior design and leaves school communities to select and arrange generic furniture from stock catalogues. As a result the research literature into school design has focused primarily on building quality and the impact of school facilities, such as air conditioning, on learning outcomes. Little is known about the ways teachers have used classroom spaces, or how they are using new learning environments, to suit children’s needs and their own teaching practices. These factors, plus a general tendency to confuse interior design with interior decoration, have resulted in a lack of knowledge by architects, designers and educators about the link between school design and pedagogical practice.

The argument of this thesis is not that interior design will affect pedagogical change, but rather that it has a role to play in supporting, facilitating and promoting a new culture of learning and teaching. In support of this claim, this chapter notes that designers and educators have been drawing inspiration from alternative child-centred pedagogical models, including those of Rudolf Steiner, Maria Montessori and Reggio Emilia, that link the design of the physical environment to pedagogical theories about child development. Another source of inspiration for school architects is new research into the history of school design, especially collaboration between innovative educators and pedagogically aware architects who designed school buildings from the inside out starting with a thorough understanding of children’s and teachers’ needs. It is argued in the literature that such user-centred design processes are key to empowering children and teachers, inspiring community engagement and ownership, and supporting sustainable cultural change.
1.2 THE DESIGN PATTERN FOR CONVENTIONAL CLASSROOMS

Research by British architect Mark Dudek (2000) and British education historians Catherine Burke and Ian Grosvenor (2008) highlights the significance of the design pattern for the twentieth century Modernist cellular classroom. They argue that the design of the cellular classroom fosters particular learned behaviours and power dynamics in teacher-child relationships, which this chapter briefly explores to better understand widespread consensus that conventional school buildings and pedagogical practices are failing to meet the needs of rapidly changing school populations (Dudek, 2000; Fisher, 2005a). However, as this research demonstrates the cellular classroom is deeply embedded in western expectations of school, making it likely that until school can be conceptualised in ways other than multiples of class groupings of 25 children and one teacher the design pattern for cellular classrooms will persist in some form.

In western education the cellular classroom has been “taken for granted as a context for learning and teaching” (Pointon & Kershner, 2000 p. 117). Its ubiquity has been mistaken for cultural neutrality when in fact, because it is so deeply entrenched in our collective imagination, the cellular classroom is one of the most culturally powerful design patterns ever developed (Bear, 2001; Burke, 2005a). Its rectangular architectural form and its stereotypical spatial organisation, characterised by formal rows of tables and chairs, are both familiar and distinct. Its visual language is an expression of institutional neutrality conveyed by a dull colour pallet, broad windows, fluorescent lighting, bland textures and impervious materials. Classroom textures embodied in hardwearing carpet squares, washable laminate tabletops and steel frame chairs with rigid plastic seats are physical manifestations of industrial production. The spatial organisation, furniture selection and arrangement, colours, textures, fittings and lighting are all designed for functional and pedagogical efficiency rather than for the comfort of children and teachers.

The design and pedagogy of the cellular classroom promote a child-teacher relationship that Sanoff (2002) characterises as ‘lecturing and listening’, which reinforces conventional assumptions that the teacher holds knowledge and children are passive learners (Fisher, 2005a; Lippman, 2004b; Upitis, 2004). Embedded in its design pattern are environmental cues designed to elicit agreed or accepted behavioural norms, which Amedeo and Dyck (2003) refer to as ‘behavioural agendas’, that shape school routines and regulate how children and teachers use space and furniture in relation to pedagogy (Burke, 2005a; Comber, Nixon, Ashmore, Loo and Cook, 2006). During written tests, for example, classroom tables are separated and piles of books are erected as barriers to discourage children from consulting their neighbours’ work, underscoring assessment as individual and summative. The behavioural agenda implicit in this furniture arrangement is so well
understood, Pointon and Kershner (2000) suggest, children will immediately understand what behaviour is appropriate.

School furniture, particularly the teacher’s desk and child’s chair, are culturally powerful symbols both in literary fiction and academic literature. In *The Adventures of Tom Sawyer*, for example, the master’s desk as a forbidden zone, inside which is a mysterious book. Alone in the schoolhouse one afternoon Becky Thatcher takes an ill-fated chance to satisfy her curiosity and for the remainder of the afternoon she fearfully anticipates her punishment, knowing the master will soon unlock the desk and discover the accidentally torn page. Twain’s (1924) narrative highlights a power imbalance between children and teachers manifest in the spatial organisation of the schoolhouse that locates the master’s desk at the front of the room in a position of power overlooking rows of children’s desks. In examinations of more contemporary classroom spaces Pointer and Kershner (2000) and Kaya and Burgess (2007) argue that a child’s chair is central to a sense of personal comfort, security and territory. Children’s chairs are also woven into classroom routines such as stacking chairs on table tops at the end of the school day. This is part of children’s ‘going home’ ritual and a keen reminder of the cellular classroom’s industrial efficiency, because stacking the chairs makes the room ready for cleaning.

Burke and Grosvenor (2008) argue the cultural identities of ‘schoolteacher’ and ‘schoolchild’ are constructed and maintained in classroom spaces. At the front of the room the teacher holds the power and authority to discipline. At the back of the room children struggle against authority and those who misbehave are relocated to sit under the teacher’s gaze. Pre-school children learn these roles and the pattern of ‘the classroom’ from caregivers. They ‘play’ school arranging their toys in rows and assuming the teacher’s part themselves thus participating, albeit indirectly, in the culture of school (Vygotsky, 1978). Walker (1991) suggests ‘informal teachers’ seek to alter these identities and promote more collaborative learning relationships by attempting to change the environmental cues of the classroom. They arrange furniture in small clusters to direct children’s attention towards their peers, thus freeing the teacher to facilitate children’s activities. They also introduce cushions, rugs and domestic furniture to humanise classroom spaces and create inviting and homely places for construction and games, or more commonly a quiet reading corner.
1.3 KEY PEDAGOGICAL DRIVERS OF SCHOOL BUILDING REFORMS

In 2000 American learning sciences researchers John Bransford, Suzanne Donovan and James Pellegrino, under the auspices of the American National Research Council Committee on Learning Research and Education Practice, published a book titled *How People Learn: brain, mind, experience and school* that was profoundly influential in driving current international education reform. It draws together key research from the fields of infant, child and adult learning, artificial intelligence, and neuroscience to describe a new pedagogical context geared towards what the authors describe as the ‘new knowledge society’. Bransford et al. (2000) explain that learners construct their own meanings based on the beliefs, cultural practices and understandings that they bring with them to school. Therefore, they argue, it is important for teachers to find out what each child knows, what their passions and interests are, what they care about, what their current skills are, and what they would like to become skilled in. This approach to learning and teaching describes a learner-centred pedagogy, which has prompted a re-examination of the child-centred philosophies of Vygotsky, Montessori and Steiner.

Bransford et al.’s (2000) emphasis on collaborative learning and teaching practices has also prompted renewed interest in the child-centred philosophies of the municipal infant toddler centres and preschools of Reggio Emilia, Italy, commonly referred to as Reggio, and in Howard Gardner’s theory of multiple intelligences. Gardner’s cognitive research suggests all learners possess linguistic, logical/mathematical, musical, kinesthetic, visual/spatial, interpersonal and intrapersonal intelligences, and that individual learners differ in the strength of these intelligences, and how they are summoned and combined to execute tasks, solve problems and achieve goals. Gardner (2006) argues that these differences challenge a conventional education system that assumes all children can learn in the same way at the same time using the same learning materials. Gardner’s theory resonates with Reggio founder Loris Maliguzzi’s argument for the hundreds of languages of children (Edwards, Gandini & Forman, 1998). Maliguzzi argued that children possess hundreds of expressive languages, including movement, dance, painting and sculpture, that they use to test theories and develop understandings about the world around them.

The education philosophies of Reggio have influenced the development of child-centred pedagogies at Bialik and Wooranna, and other schools throughout Australia, via scores of publications, touring exhibitions, and the work of local academics, including Jan Millikan and Stefania Giamminuti (2014), who have been discussing Reggio ideas in an Australian context. Reggio’s concept of the physical environment as ‘the third teacher’, captured in Gardner’s (1999) description of its centres and preschools, has been especially influential for school design (Bruce Mau Design, 2010). Every aspect of Reggio’s physical
environments has been calculated to stimulate children’s innate curiosity and desire to learn. This includes the use of glass to create visually transparent interiors, soft colours to create a neutral background for children’s activities and their work, plants to introduce natural colours, textures and forms, and transparent storage containers to hold and display tools and materials in child-centred environments.

Similar observations have been made about Scandinavian design exemplars such as the Hellerup School, 2002, Copenhagen, Denmark by Danish architect Jens Guldbaek. Such schools have captured the imagination of Australian school architects because of their beautifully considered use of materials and understated, but adventurous design. Reggio and Hellerup are also pedagogical exemplars and it is the demonstration of the interrelationship between the education vision, pedagogy, curriculum and design that has helped direct the international search for new school design patterns.

1.4 THE SEARCH FOR NEW SCHOOL DESIGN PATTERNS

Just as Tadao Ando’s design for the Ibaraki Kasugaoka Church, 1989, Osaka, Japan re-imagines the familiar design pattern for churches, school architects and designers are re-imagining the design patterns for conventional school buildings, corridors and classrooms in a quest to develop twenty-first century learning environments. Importantly, this includes acknowledging the diversity of school populations, a trend towards individualised learning, and creating opportunities for children to engage in learning using multiple intelligences and a range of learning modalities (Gardner, 2006). New school spaces and places also recognise the need for children to have access to a wide variety of tools, materials and technologies so they can communicate their learning using hundreds of expressive languages (Edwards, Gandini & Forman, 1998). There is also concern for the development of social spaces and collaborative environments to encourage children to develop strong social values as members of supportive learning communities (Giudici & Rinaldi, 2001).

Characterised as a push to develop ‘authentic learning contexts’ (DEECD, 2009c) the search for new school design patterns is supported by an increasing number of claims that ‘good design’ positively influences learning and teaching attitudes and relationships (CABE, 2002, 2009c, p. 3), increases the effectiveness of school (CABE, 2009c; Gislason, 2009) and improves teacher job satisfaction levels and retention rates (Buckley, Schneider & Shang, 2004). The criteria for good design here centres on functionality, usefulness, “improved quality of life, equality of opportunity and economic growth” as well as “the aesthetic improvement of our environment” (CABE 2002, Introduction). In their attempts to create real and meaningful learning environments architects and designers
are re-examining landmark historical examples of school design innovation (Burke & Grosvenor, 2008). They are studying design exemplars within progressive education such as Steiner and Montessori schools (Dudek, 2000; Hertzberger, 2008), and increasingly they are working with school communities to develop new organising concepts and spatial metaphors intended to break down the conventional patterns of school design and create new ones.

Dutch architect and academic Herman Hertzberger (2008) and British architect Mark Dudek (2000, 2008/2015) have been critical sources of historical reference for this thesis because they trace current trends and school design patterns back to their historical roots, which are often associated with progressive education and the experimental periods that preceded previous large-scale education and school building reforms. Contemporary education reforms are also stimulating international interest among education historians in the traditions of school design and in the material culture of schools. Burke and Grosvenor (2008), for example, review the influence of Modernist designers in shaping models of research-based school design practice and how progressive architecture and interior design have been used to develop alternative learning environments that promote social and education reform. Whereas Lawn and Grosvenor (2005) are interested in “the materiality of schooling, that is, the ways that objects are given meaning, how they are used, and how they are linked into heterogeneous active networks, in which people, objects and routines are closely connected” (Lawn & Grosvenor, 2005, p. 7).

These new histories reveal two parallel narratives of school design that provide insights into the current challenges of redefining what constitutes good design in schools (Burke, 2010a; Dudek, 2000; Frith & Whitehouse, 2009; Hertzberger, 2008). The first narrative charts the development of the modern school from the Victorian era monitorial system to the Fordist cellular classroom and corridor plans, synonymous with conventional Western expectations of school. The second captures successive periods of school building reform including notable collaborations and exchanges of ideas between innovative educators and designers, such as education luminary John Dewey and renowned architect Frank Lloyd-Wright (Dudek, 2000). The first of these narratives supports the now uncontested argument that the design pattern for cellular classrooms is no longer suitable for twenty-first century learning (Beare, 2001; Fisher, 2005a; Nair & Fielding, 2005). The second identifies alternative school design patterns specifically developed to support the kinds of collaborative, experience-based learning being promoted by current education reform.
1.5 SCHOOL DESIGN RESEARCH

Support for the influence of school design on learning and teaching activities and behaviours can be found in American, Australian and New Zealand research into the impacts of school facilities on learning and teaching outcomes (Earthman, 2002; Fisher, 2000; Lackney, 2004a; AC Neilson, 2004; Young, Green, Roehrich-Patrick, Joseph & Gibson, 2003; Uline & Tschannen-Moran, 2008; Uline, Tschannen-Moran & Wolsey, 2009). Australian researchers Cleveland and Fisher (2015) show the vast majority of school design research is in the form of post occupancy evaluations that deal with the quality and maintenance of school buildings and facilities. And as the literature reviews produced by British academic Pamela Woolner and her colleagues demonstrate, where it does examine school interiors the focus is on classroom organisation rather than interior design (Higgins, Hall, Wall, Woolner & McCaughey, 2005; Woolner, Hall, Higgins, McCaughey & Wall, 2007).

1.5.1 Post Occupancy Evaluation Research

American and British studies including those by Evans and Maxwell (1997), Haines (2001), Tiburico and Finch (2005) and Schneider (2002, 2003), into the effects of isolated environmental factors such as noise, air quality/climate, heating, ventilation and lighting on learner performance indicate that environmental factors do influence education outcomes. However, as Higgins et al. (2005) suggest, there is little understanding of how these factors influence one another. For example, it is not known whether the benefits of good ventilation through air-conditioning outweigh the negative effects of the noise produced by air-conditioning systems. Other American studies report that well designed school environments, where consideration has been given to the aesthetic environment and to user comfort, can improve teachers’ job satisfaction levels and retention rates (Buckley, Schneider & Shang, 2004; Earthman & Lemasters, 2009; Roelofs, Visser & Terwel, 2003).

1.5.2 Environmental Behaviour Research

American environmental behaviour researcher Lennie Scott-Webber’s exploration of the kinds of spaces required to support specific modes of learning has drawn mainstream attention to the integral role of the built environment, and by association interior design, in creating contexts for learning activities. In Australia her ideas have indirectly informed Victorian government policy around school design via Fisher’s (2005a, 2005b) work. Fisher also contributed the development of DEECD’s design guidelines for new school buildings (DEECD, 2008b), which include reproductions of Scott-Webber’s spatial diagrams, that have informed Australian discussions about what kinds of learning settings are required in new learning environments. Her work is part of a growing
body of literature concerned with that Fisher describes as ‘the link between pedagogy and space’, all of which is grounded in a conviction that built environments influence learning and teaching behaviours.

Scott-Webber (2004) argues that particular spatial environments are required for different knowledge processes. She defines ‘delivering knowledge’ as a formal, teacher-led activity, such as in classrooms and lecture theatres, where furniture arrangements direct the learners’ attentions towards the teacher. ‘Applying knowledge’ is a learner-centred activity where the learner, as apprentice, is directly supervised by the teacher in settings, such as art and design studios, science and computer labs, and workshops. ‘Creating knowledge’ is the process of moving knowledge from abstract concept to concrete product, where individuals with different skills and expertise work together on a shared project in general work areas equipped with specialist facilities. Settings for ‘communicating knowledge’, such as learning streets, learning commons and casual meeting areas, are for sharing information quickly and informally. ‘Using information for decision-making’ is about sharing and dispersing knowledge where learning can be both passive and active, such as one-to-one conferences and group discussions.

1.6 THEMES OF INTEREST
Evident in the school design literature are seven themes that are of particular interest to this thesis. The first ‘schools as pedagogical statements’ demonstrates the function of school buildings as architectural expressions of education reform. This is of interest because it points to the potential of school interiors to communicate new cultures of learning. The second, ‘reclaiming circulation space for learning’ illustrates a general trend in contemporary school design to reconfigure school corridors as informal learning environments. The third, ‘flexibility’ reveals the challenges of designing learning spaces that can be used by different groups for different activities and for varying periods of time. For this research the role of flexibility in the delicate relationship between purposeful design and prescriptive design is a central concern. The other four themes, ‘community and design collaboration’, ‘collaborative design’, ‘participatory design’ and ‘a common language’ look at different aspects of the relationship between designers and users and the use of design to create spaces to support learning communities as cultural groups.

1.6.1 *Schools as Pedagogical Statements*
For some school architects the pursuit of new school design patterns involves rethinking how school buildings can be embedded with contemporary values and curriculum concerns, such as environmental sustainability, or how ICT can be integrated as new tools for skills development. For example, architects and designers are examining ways of developing
school buildings as ‘three-dimensional textbooks’. One approach is to reveal the building mechanics by leaving key aspects of the structural frame, ventilation system, or services exposed as demonstrations of architectural design and function. Another approach, stimulated by concerns about climate change and the need for energy and water efficient buildings, is to develop school facilities that include environmental monitoring equipment that provides opportunities for children to study the environmental efficiency of their learning environments (DfES, 2004a). As a concept the three-dimensional textbook is different to Reggio’s third teacher, evident in the interiors at Bialik and Wooranna, which refers to the potential of spaces and places to provoke learning experiences because of the possibilities for exploration and discovery in their design and available resources.

1.6.2 Reclaiming Circulation Space for Learning

Collaborative research by Australian and American academics suggest that learning happens everywhere, including in the hallways and corridors between formal learning settings (Jamieson, Dane & Lippman, 2005; Jamieson, Fisher, Gilding, Taylor & Trevitt, 2000). This has prompted a general trend towards reclaiming circulation spaces and remodeling them as ‘learning streets’ and ‘learning commons’ (Nair & Fielding, 2005). Classrooms are being replaced by ‘learning neighbourhoods’ (Copa, 1999) and ‘home bases’ (DEECD, 2008b), and attempts are being made to blur the physical boundaries of school buildings, which is evident in the design patterns for ‘indoor courtyards’ and ‘outdoor classrooms’ (DfES, 2004a). Unlike previously unsuccessful attempts to rezone circulation space as ‘multi-purpose’ areas, which hampered circulation (Medd & Medd,
1972; Seaborne, 1971; Smith, 1974), the design pattern for learning streets incorporates furnished settings, or ‘niches’ (Scott-Webber, 2004), into circulation spaces as shown in Figure 1.1. The niches interrupt the linear thrust and forward trajectory of conventional corridors and hallways acting as magnets (Scott-Webber, 2004), drawing children and teachers to inhabit circulation spaces and engage in informal learning experiences and social relationships.

Encapsulated in new school design patterns are ideas about collaboration and learning communities that are helping to redefine learning as a social and collaborative activity and “school as a place of culture” (Giudici & Rinaldi, 2001, p. 38) where children develop social values and belief systems. Design patterns and concepts for ‘home bases’, ‘small learning communities’ (DEECD, 2008b), ‘activity settings’ (Lippman, 2004b), ‘learning centres’ (Parnell, Cave & Torrington, 2008), ‘schools-within-schools’ (Lackney, 2009), and ‘learning neighbourhoods’ clearly articulate a shift in the culture of education away from direct instruction to a wide variety of collaborative and experiential modes of learning and teaching. This shift is informed by Gardner’s theory of multiple intelligences, which Nair and Fielding (2005) draw on to argue that the pattern language for twenty-first century learning environments must provide opportunities for children to express and develop their linguistic, logical/mathematical, musical, kinesthetic, spatial, interpersonal, intrapersonal and naturalist intelligences.

Nair and Fielding (2005) also use four learning metaphors, attributed to American Public Broadcasting Service (PBS) commentator David Thornburg, to explain the organising logic for learning spaces. ‘Campfires’ are where children learn from experts or storytellers. The aim of these settings is to direct children’s attention towards the expert or storyteller. ‘Watering Holes’ are geared around peer learning. They are informal spaces where children from different groups can come together to share ideas in an informal environment. ‘Caves’ are places for independent learning or study. They are usually smaller and more enclosed spaces where children can consolidate and reflect on their learning. Finally, ‘Life’ is where children can apply what they have learned to real world projects. These are experimental environments, laboratories and workshops where theories and ideas can be tested and refined. There are some clear resonances here with spatial types and learning activities put forward by Scott-Webber (2004) discussed earlier.
1.6.3 Flexibility

Flexibility is a reoccurring theme in the literature although what it means for learning spaces is unclear because it has multiple meanings and uses in debates about school design. DEECD, for example, suggests that:

the term flexibility applies both to learning spaces that are designed so as to ensure multiple uses and furniture arrangements, and to spaces that can be reconfigured through such means as operable walls. Flexibility can also refer to the degree to which learning spaces can evolve over time, in their current or a reconfigured form to accommodate changing pedagogical approaches, models of education, changing enrolment numbers and community linkages (DEECD, 2009c, p. 2).

In reference to space and furniture arrangements flexibility is implied in the terms, multi-functional, moveable, diverse (Featherston, 2004, August), customisable (DEECD, 2009b; Ponti, 2005), fluid, versatile, convertible, scalable and modifiable (Monahan, 2002). It is employed as a defense against design obsolescence and the political imperative to future proof new school building developments (British Design Council, 2004-5). Flexible, modular design components are also part of an accepted strategy for dealing with inevitable, but unknown changes (DEECD, 2009c, R. Alexander, 2009).

Pedagogical choice is implied by ‘flexible learning spaces’, which school communities can organise and furnish to suit their particular needs “depending on the ages and stages of the learners, the activity, the number of students, and the facilities, equipment and resources required” (DEECD, 2008b, p.10). DEECD claims its BER “designs promote active, student-centred learning for all students through the creation of flexible functional spaces that support contemporary learning and teaching practices” (DEECD, 2009c, p. 1), and that “flexible design… promotes collaborative teacher practice” (DEECD, 2009c, p. 2). It also claims flexible spaces enable flexible curriculum delivery (DEECD, 2009l), flexible student teacher groupings (DEECD, 2009j) and flexible time tabling (DEECD, 2008c). During a period when learning culture is in a state of flux, flexibility promises to smooth the transition to collaborative, experience-based learning.

For this research flexible interiors are of particular interest because they are being used in school building templates in preference to purposefully designed settings (DEECD, 2009h). Arguably there is an inherent risk with this approach because although flexible spaces can be adapted for multiple purposes they are not especially well suited to any of the activities they might be used for. There are also problems with purposefully designed interiors because they may limit how users interpret and inhabit them (Perkins, 1986). A real challenge exists in discovering an effective balance between flexible and purposeful
so that new school interiors, especially learning neighbourhoods, can respond to the changing needs of learning communities day-to-day and over time.

1.6.4 Community and Design Collaboration

Bransford et al. (2000) suggest that the degree to which learning environments are community centred is important for learning. This redefinition of learning as a communal and collaborative endeavour involving not just children and teachers but the broader community in which a school is located is central to current education reforms. It is captured in government planning and discussion documents promoting community oriented new school building and refurbishment programs in Australia (DEECD, 2008b, 2009a, 2009c) and the UK (DfES, 2004a, 2004b). American school architects are re-examining design concepts such ‘agoras’ and ‘shopfront schools’ (C. Alexander et al., 1977) as metaphors for community, and as strategies for locating schools within the wider community (Nair & Fielding, 2005). In Australia new school plans include public areas to encourage family involvement in school life and private zones for learning communities. School architects are also considering how school facilities can be shared with the rest of the community, as well as how community facilities can be made available to schools (DEECD, 2009j, 2009k; DfES, 2004a).

Despite the metaphor of community expressed in new school design patterns, engaging school communities in design processes has proved challenging. British, Australian and American architects agree that a key to successful school building design is involving school communities in the design process (CABE, 2004; Fisher, 2005a; Nair & Fielding, 2005; Sorrell & Sorrell, 2005). But, as British researchers assessing the consultation processes of the BSF program demonstrate, exactly how to effectively facilitate community involvement in school design is not yet clear (den Besten, Horton & Kraftl, 2008; Newman & Thomas, 2008; Parnell, Cave & Torrington, 2008). A criticism of the BSF program was that school communities were engaged in consultative and participatory processes rather than collaborative ones. Lackney is equally critical of school design processes in the USA where a “tendency towards inauthentic user involvement in both planning and design continues to be a stumbling block resulting in non-functional design solutions” (Lackney, 2009, p. 166).

1.6.5 Collaborative Design

Sanoff (2008) claims there is reciprocity in the relationship between designer and participants, which suggests children are uniquely placed to help architects and designers learn about contemporary school experience, which Lackney (2009) points out, may be quite different to their own. Woodcock (2008) notes that increased attention is being
paid in all fields of design to human-centred, or user-centred, design processes that place children and teachers at the centre of school design processes. This is very different to the powerless, voiceless position children occupied in the past (Burke & Grosvenor, 2003) when they endured alienating education experiences and ‘prison-like’ physical environments determined exclusively by adults (Blishen, 1969). However, the extent to which children can participate in school design is limited by their experience and understanding of physical environments and because of their inexperience, they often lack the skills necessary to effectively articulate or visualise their ideas. As a result they are allocated informal and social spaces to design, but not formal learning areas (den Besten, Horton & Kraftl, 2008).

Nevertheless there are examples of children being supported to participate directly in the design conversation rather than having their ideas translated by someone else. One is documented in a study conducted by South Australian researchers Barbara Comber, Helen Nixon and Louise Ashmore, which examined a strategy devised by a small group of teachers in collaboration with an architect to actively engage children as participants in an urban renewal project. Initially children were shown images of a-typical architectural forms to immerse them in the visual language of architecture. As a group they discussed the images to develop a working design vocabulary around ‘design’ and ‘belonging’ that they used to consider who might use particular buildings and how. They were also shown fundamental techniques, such as plan drawing, to help them visualise their ideas. Equipped with a working design vocabulary and basic visual communication skills, children made meaningful contributions to the renewal and development of their urban environment as active participants in an ongoing collaborative design process (Comber et al., 2006).

1.6.6 Participatory Design

British architect and academic Bryan Lawson (2006) argues that designers understand and discuss design differently to users, because of this, Stringer (1996) suggests, one purpose of design participation is to mediate between the different construct systems of designers and users to arrive at a common understanding about what is being designed. American school architect, Bruce Jilk employed a participatory design process, described by Burke and Grosvenor (2008) as ‘designing down’, to consult with children, teachers and the community of Ingunnarskoli, an elementary school in Reykjavik, Iceland. Together they identified key concepts including ‘community’, ‘nature’, ‘spirit’ and ‘flow’ which were articulated as signs, symbols and metaphors that could be understood by both architect and users. Jilk then developed a building that is an architectural expression of their shared understanding about what it means to learn and teach at Ingunnarskoli. Unlike the earlier example where children used newly acquired
visual communication skills to ‘talk design’ Jilk developed a metaphorical communication based on the spoken language that all participants could already use (Tomes, Oates & Armstrong, 1998).

There is an apparent nexus between the need to develop a common language to facilitate design collaboration between design professionals and school communities and the need to more effectively translate localised design innovation in mainstream school design. Nair and Fielding (2005) suggest that the primary barrier to design collaboration between school communities and design professionals is that they do not share a common language. Their argument is that design language is often foreign to non-designers and it impedes genuine collaboration. Also, significant changes in learning and teaching practice mean that architects and designers can no longer draw on their own experience of school to understand contemporary education (Lackney, 2009).

As this thesis demonstrates a primary barrier to translating design innovation to mainstream school design is the proper documentation of design patterns for school interiors. It argues that both these challenges can be addressed by documenting a pattern language for school interiors that draws on the professional expertise of teachers and designers.

1.6.7 A Common Language

Internationally a variety of community resource documents aimed at providing school communities and design professionals with tools for collaboration have been produced by groups and organisations, including the American Architectural Foundation (2005, 2006a, 2006b), CABE (2004), and the Council of Education Facility Planners International (CEFPI) (Cleveland, Frith & Woodman, 2010). There is also a growing collection of school design manuals including those by Sorrell and Sorrell (2005), Dudek (2015), A. Taylor (2009) and Nair (2014). Arguably the most influential of these publications is Nair and Fielding’s The Language of School Design: design patterns for 21st century schools, now in its third edition (Nair & Fielding, 2013). It presents a collection of 27 architectural patterns for school buildings, precinct, spaces and places using simple, accessible writing and pictorial content designed to bridge the communication gap between designers and school communities. The design patterns ‘welcoming entry’, ‘dispersed technology’, ‘transparency’ and ‘flexible spaces’, were included in the architecture templates for the UK’s BSF and Australia’s BER programs.

Locally DEECD has produced various resources to support design collaboration between architects and school communities. These included a Research and Innovation Conference and an Innovative Learning Environments Expo Series with presentations by Australian
education expert Julia Atkin, former co-director of New Zealand’s acclaimed Unlimited School Vince Dobbs, plus presentations by school communities. DEECD also produced online resources including *Linking Pedagogy and Space* (Fisher, 2005) and *Victorian School Design* (DEECD, 2008), a resource for school communities, facilities managers and architects that articulates the relationship between learning and design. Also included are select school case studies organised under the categories Stages and Spaces, Community Use, Information and Communication Technology (ICT), Ecologically Sustainable Design, and Special Features, which showcases the interiors designed by Featherston at Wooranna.

In addition to the work of DEECD there is a strong and growing research community in Victoria examining changing pedagogical practices and the design of education facilities, including Independent Schools Victoria, Catholic Education Melbourne, the Reggio Emilia Australia Information Exchange (REAIE), and the Victorian chapter of CEFPI. Academics at Deakin, Swinburne, Monash, RMIT, and Melbourne Universities are also exploring various aspects of pedagogy and space from kindergarten to university and beyond into the workplace. In particular, the University of Melbourne’s Learning Environments Applied Research Network (LEaRN) has become a significant point of focus for the exchange of ideas between researchers, architects, designers, educators, landscape architects, and facilities managers. It hosts regular discussion forums and an annual research symposium supported by local academics including Kenn Fisher, a key advisor to DEECD, and Peter Jamieson, who has been instrumental in rethinking tertiary spaces and transforming conventional lecture theatres and libraries into active and engaging social learning environments (Jamieson, Dane & Lippman, 2005).

The architectural concept of a pattern language, employed by Nair & Fielding (2013) and best exemplified by C. Alexander et al. (1977), is of particular interest to this research both as means of engaging school communities in school design processes and as a vehicle for documenting and sharing design patterns for school interiors. The potential of a pattern language to involve non-designers, especially teachers, in school design processes lies in its structure which guides users through a decision-making process that helps them to select all the components necessary to create a learning environment. The design patterns that make up a pattern language are conceptual building blocks that can be fitted together in limitless combinations to create innumerable different physical environments. Later on Chapter 5 documents the design patterns identified at Bialik and Wooranna and makes the case for a pattern language for school interiors, suggesting it may be an effective way to document children and teachers’ day-to-day interactions with their interior environments, which could provide much needed insights into the cultural function of interior design.
1.7 DESIGN TEMPLATES FOR AUSTRALIA’S EDUCATION REVOLUTION

In 2009 the design pattern for learning neighbourhoods was given a significant promotional boost when school building design in Australia became linked to economic stimulus in the face of a global economic crisis. The *Building the Education Revolution* (BER) program was the central feature of the Australian Federal Government’s economic stimulus package, the *Nation Building and Jobs Plan* (DEECD, 2009e). It was designed to create jobs and short-term economic stimulus that would shield the Australian economy from the effects of the global financial crisis. For primary schools, funding was available for new libraries and multipurpose halls, classroom replacement, and refurbishment of existing facilities. In Victoria BER funding was consolidated with State Government funding for the *Victorian Schools Plan* (VSP), a 10 year, $1.9 billion program to rebuild, extend or renovate all Victorian school buildings by 2017.

It was a requirement of the BER that all new school building and refurbishment projects were undertaken in the 2009/10 financial year, necessitating the design, procurement and construction processes to be fast-tracked (DEECD, 2009a). To help school communities meet the implementation time lines, design templates were developed on a state-by-state basis by consortia of architects and education experts (DEECD, 2009a). In Victoria templates for learning neighbourhoods were developed to replace conventional classrooms. These were largely open plan environments that combined specialist facilities, integrated digital technologies and general learning areas. Flexibility and choice were implied through features such as operable walls, mobile furniture units, interconnecting tables and double-sided screens. The templates also included modular architectural components designed to fit together to produce neighbourhoods of various sizes depending on the accommodation requirements of each school.

Interestingly the UK’s BSF program, which was a British Labour government initiative to rebuild all secondary schools in England by 2020, was discontinued in 2010 and replaced by a template design strategy similar to Australia’s BER. Due to time and budget overruns, and the poor design standards of most of the completed buildings assessed by CABE the BSF program was halted. Britain’s *Review of Education Capital*, the James Review (2011), describes the BSF scheme as well intentioned, but far too ambitious and excessively bureaucratic in the way that it was administered. The report is also critical of the development of bespoke design solutions, often in response to poorly formulated design briefs, and recommends the development of a small number of fit-for-purpose template designs that can be tailored to meet the needs of individual school communities. However, for this research the BSF design developments are still of great interest because they directly influenced the trajectory Australian school design developments.
1.7.1 Learning Neighbourhoods

In Victoria, the concept of ‘learning neighbourhoods’ has been widely promoted as the twenty-first century alternative to conventional classrooms. The design pattern for learning neighbourhoods formalises a pre-existing trend in some Australian schools of removing walls between conventional classrooms to create collaborative environments (Featherston, 2006). In these experimental spaces teachers have been working together by pooling resources to create multiple learning settings for large learning communities where children work in collaborative groups of various sizes on wide ranges of simultaneous activities (Parnell, Cave & Torrington, 2008). Out of these experimental environments have developed the concepts of ‘collaborative learning communities’ and ‘teaching teams’, and the architectural design pattern for learning neighbourhoods illustrated in Figure 1.2.

![Image of 21C Library and Learning Neighbourhood](https://example.com/21CLibrary.png)

**FIGURE 1.2 - 21C Library and Learning Neighbourhood**
Floor plan prepared by Hayball and Grey Puksand (DEECD, 2009h, p.12)

The BER templates developed for Victorian learning neighbourhoods are composed of four basic spatial types or zones—home bases, library and learning resource centres, shared collaborative areas, and customisable settings. At the centre of the neighbourhood plan in Figure 1.2 is the library and learning resource centre, which was intended to combine specialist library, audiovisual and computer resources with collaborative learning settings. Shared collaborative areas were zoned for children from different home groups to work together. These spaces link the library and learning resource centre with the home bases on the neighbourhood perimeter. Finally, ‘customisable settings’ are circular architectural devices, referred to as ‘knuckles’ (DEECD, 2009h), that are used to hinge learning neighbourhoods together enabling modular expansion. The descriptions of each of these settings are intentionally speculative and open ended because school communities were
required to fit out the empty, largely open plan, architectural spaces themselves according to their particular needs and requirements.

Only home bases, shown in Figure 1.3, are clearly defined. They are self-contained spaces, similar to the conventional classrooms shown in Figure 1.4, for a group of children and a single teacher. BER home bases are “combined in threes or fours to create distinct learning communities, each with their own shared learning space. In turn, learning communities are combined to form learning neighbourhoods” (DEECD, 2009c, p. 4). Conceptualised as flexible, ICT enriched zones with indoor and outdoor connections, home bases were designed to support one-to-one, small group and large group activities (DEECD, 2009h). The template drawings indicate power and data cabling for desktop computers, electronic whiteboards and data projectors in each home base. They also show multiple possible spatial configurations, created by arranging loose furniture, and connections to shared collaborative areas via operable walls. External windows and sliding glass doors suggest good natural light, direct access to external learning courts, and passive supervision by teachers of children working outside. The text accompanying the drawings explains that for younger children a home base is a permanent home with their teacher that gives them a sense of security, identity and belonging (DEECD, 2009c, p. 3). For older children a home base is a starting point from which to develop independence and interdependence (DEECD, 2009c, p. 4).

Despite the reform agenda implicit in Victoria’s BER template drawings, there is no detailed guidance for school communities about how to organise their interior environments to promote new learning and teaching practices and relationships. Rather, as Figures 1.2 and 1.3 illustrate, the templates present indicative arrangements of loose furniture sketched onto empty neighbourhood interiors to demonstrate that these environments are flexible and customisable. Anecdotal evidence suggests that school communities...
are routinely closing operable walls and re-instating classroom routines in an effort to
manage the vast, flexible, open and noisy spaces characteristic of new school architecture.
This suggests that more detailed guidance about how to shape effective school interiors is
required. Information is also required about how to select furniture, how to develop and
resource a variety of learning settings, and how to plan the spatial organisation of
learning neighbourhoods including well-articulated circulation routes.

These are new challenges for school communities whose previous experience is limited to
arranging stock furniture in conventional classroom spaces (David, 1982). Victorian state
and private schools as well as education bodies, such as Catholic Education Melbourne,
have been calling on interior design experts to advise and guide their staff. This necessary,
but overlooked and misunderstood transition from new school buildings to purposefully
designed interiors has provided impetus for the current study. Of specific interest is the
opportunity to provide assistance, guidance and support for school communities to shape
the spatial organisation of neighbourhood interiors into purposefully designed learning
settings. This includes the careful selection of task-specific furniture, providing appropriate
light or shade and resourcing each setting with the tools, equipment and resources needed
for each learning activity. Together these elements of interior design can communicate
to children the purpose and function of each setting and may provide clues about how
to use it and exploit its potential to support their learning investigations.

1.7.2 Learning Settings
In this thesis ‘learning setting’ refers the places, spaces and venues within learning
neighbourhoods where learning experience happens. Other authors use ‘activity
settings’, ‘activity nodes’ and ‘activity pockets’ (C. Alexander et al., 1977; Lippman,
2004b), ‘learning centres’ (Parnell, Cave & Torrington, 2008) and ‘behaviour settings’
(Barker, 1968) to refer to these places, spaces and venues. Barker suggests children
perform behaviours appropriate to particular contexts, such as classrooms, where their
behaviour is a social response to the classroom as a culturally constructed environment,
or behaviour setting. American academic Gary Moore is critical of Barker’s definition
of ‘environment’, suggesting it is limited to social and behavioural contexts, with little
reference to physical contexts (Moore, 1986, pp. 205-206). A similar dislocation is
evident in the education literature where ‘learning environment’, usually refers to the
pedagogical context, separate and distinct from the physical learning environment (see
for example Bransford, et al., 2000). Moore argues that the effects of the physical and
the social/behavioural aspects of learning environments must be considered together.
Moore’s quantitative study of spatial definition in preschool behaviour settings on children’s social and cognitive behaviour is the most recent and relevant model for studying school interiors evident in a review of the literature. He describes well-defined settings as clearly differentiated from other settings by walls, partitions and furniture, which are used as dividers. He suggests that spatial definition can also be achieved by changes in floor and ceiling levels, changes in floor coverings or textures, the placement of hangings and overhead lighting, and implied boundaries between architectural elements, such as columns or wall stubs. Conversely poorly defined behaviour settings are “where the area is too large or too small for the group size, and/or where the resources and work surfaces are not readily available [or appropriate] for the particular activity” (Moore, 1986, p. 208).

Moore found that “significantly more exploratory behaviour, social interaction and cooperation occurred in spatially well defined behaviour settings than in moderately or poorly defined settings” (Moore, 1986, p. 205). He also found that many poorly defined settings were also poorly resourced, and noted that informal teaching styles and well defined behaviour settings jointly affected the number of child initiated activities, and cooperative social interactions between children. Moore also suggests that certain behaviours may be so strongly influenced by teaching styles and education philosophy “that the physical environment does not—and maybe cannot—have an independent impact” (p. 227). He concludes that children’s behaviour is a function of their total environment and that in order to understand any behaviour the independent and combined effects of both the physical and social environmental factors of the behaviour setting must be understood.

Lippman’s (2004b) re-examination of the L-shaped classroom defines the entire classroom space as a behaviour setting within which furniture and resources are organised to establish multiple activity settings of various sizes. He suggests activity settings might be considered “physical zones of proximal development” (Lippman, 2004b, Activity Settings; Vygotsky, 1978) because they afford children opportunities for self-directed learning with low levels of adult guidance and supervision. Lippman equates more enclosed settings with fewer outside distractions and higher levels of engagement by children in activities within the setting. Less enclosed settings he equates with higher levels of peripheral engagement by children with other activities going on around them. He concludes that activities requiring higher levels of concentration such as mathematics, science or language may be better suited to more enclosed settings, whereas more informal activities such as painting and drawing may be better suited to settings that are less enclosed.
From Moore (1986) and Lippman (2004b) we can conclude that well defined learning settings communicate their purpose more clearly to users than poorly defined settings. We can also conclude that some learning activities are better suited to physically enclosed settings, whereas others are better suited to more exposed settings. These spatial and environmental principals begin to describe the logic for designing contemporary learning environments composed of multiple learning settings. For the current study Moore and Lippman’s work also provides valuable insights into how the use of interior design strategies at Bialik and Wooranna, such as altering floor levels and ceiling heights, may contribute to learning experiences, and how these spatial attributes might be involved in shaping design patterns for learning settings.

1.8 THE ABSENT INTERIOR

The challenge, as this research discovered, is that despite heightened interest in the design of school learning environments, there is little understanding by architects, planners and school communities of how interior design as a discipline and a professional practice can assist in changing the culture of learning. Education reform is instead concerned with architectural transformation: the development of new school buildings as outward expressions of cultural change (Burke & Grosvenor, 2008; Dudek, 2000), and new spatial patterns as inward expressions of flexibility and collaborative learning (Monahan, 2002). Questions about how spatial organisation, furniture arrangement, integrated technologies, access to resources and the use of texture, materials and light might influence child-teacher relationships and enhance or hinder alternative modes of learning and teaching are largely overlooked. A contributing factor to this is the wide spread lack of appreciation within design industries and the public arena of how people occupy buildings, using and misusing them on a daily basis, and what the practice of interior design actually entails.

Essentially interior design is the practice of converting the insides of buildings, old and new, into habitable purposeful spaces for living and working. However, it is often confused with interior decoration and associated with fashion and style (M. Taylor & Preston, 2006). Compared with architectural design, interior design is transient and ephemeral (Sparke, 2005), and as a result it has been periodically included and excluded from architectural discourse (Sparke, 2004b). While architecture can be understood by its physical presence and extensive theorization, interior design is the experienced, but unseen aspect of built environments. It is the complex organisation of space that influences how the building functions by framing and shaping human interactions, providing the context for people’s activities, and regulating their movement within the built environment. Interior design expertise involves not only the fit out and furnishing of buildings but also the creation of experiences and ambiences using strategies such as
proportion, shape, colour, texture, acoustics and light. As such interior design is pivotal to the process of transforming more or less anonymous spaces (Thiel, 1997, p. 138) into living, expressive, ambient environments that shape users’ experiences.

The function of school interiors in the daily lives of children and teachers is under researched, poorly documented and consequently not well understood. This is largely because historically, non-designers, namely principals and teachers (David, 1982), have been responsible for designing school interiors by organising a limited and prescriptive range of furniture within uniform classroom spaces to suit their personal preferences and teaching styles. Aside from the studies conducted by Martin (2002) and Lackney (2008), little is known about the ways teachers have used and continue to use classroom spaces to suit children’s needs or their own teaching practices. Surprisingly little applied research exists into the material culture of the classroom, not only the layout of space and arrangement of furniture but also the tools, technologies and materials of schooling. There is also little research into teachers’ intuitive environmental practices, or how they share them with peers. Even less is known, as Lackney (2008) points out, about how teachers are using and organising new learning environments.

This lack of knowledge is reflected in the architectural and planning practice of building templates that are imposed on communities with little consultation. It is also evident in current funding allocations for furniture and equipment that are made directly to schools (DEECD, 2011), separate to architectural budgets. This system assumes that school communities will arrange loose items of furniture, selected from suppliers’ catalogues, without design assistance. Where new building templates and school design discourse do engage with interior design elements, typically furniture items, it is usually in reference to dividing architectural space and enabling flexibility. Occasionally interior elements are discussed with specific reference to establishing learning settings (Lippman, 2004a; Moore, 1986). But bigger questions, involving interior design thinking, about how spatial organisation, furniture arrangement, integration of technologies, access to resources, and use of texture, materials and light might influence child teacher relationships and enhance or hinder alternative modes of learning and teaching, are largely overlooked. Instead a decorative approach is taken with brightly coloured furniture and floor coverings and eye catching, over-sized graphics used to evoke notions of youthfulness and fun.
1.9 MIND THE GAP

The absence of interior design from school planning and design processes, and from broader discussions about the influence of school design in education reform defines the research gap that this thesis seeks to address. The central focus of this research was to discover what influence interior has in changing the culture of learning in primary school learning neighbourhoods. Within this larger research question are smaller questions about the social and cultural function of interior design. Such as, how the ambient qualities of individual learning settings influence the ways they are used, to what extent children and teachers adapt and modify their physical environments to suit particular activities and learning investigations, and what happens when they do. Implicit in questions about the physical, social and cultural purposes of interior design are questions about the role of the interior designer and how collaborative design processes might assist school communities to develop physical environments that are conducive to pedagogical change.

The argument of this thesis is not that interior design will affect pedagogical change, but rather that it has a role to play in supporting and facilitating the changes that school communities are trying to make. This study set out to discover whether select school interiors, specifically designed to facilitate the pedagogical innovations of two school communities, were effective in influencing and supporting the schools’ constructivist pedagogies, collaborative teaching strategies, and child-centred cultures of learning. The secondary focus of this research was to identify and document the design patterns in those interiors as the foundation of a pattern language for school interiors to support the efforts of architects and designers working with school communities to develop purposefully designed school interiors. Such a resource may be of particular interest to school communities who are looking to define specific learning settings within new BER template buildings.

The following chapter introduces the two Victorian schools, Bialik College and Wooranna Park Primary School, that provide the very local contexts for this study and the four case neighbourhoods where the interior design patterns were identified. It also introduces interior designer Mary Featherston whose design collaborations with Bialik and Wooranna illuminate the role of the interior designer working with school communities to help shape new cultures of learning. It examines Featherston’s research-based and needs-driven approach to school design, locating it within a long tradition of school architects and designers working with and learning from school communities about the ways children and teachers use and inhabit their learning environments. Two historical examples, Crow Island School, 1940, Winnetka, Illinois, USA, and Eveline Lowe Primary School, 1966, London, England, UK are examined in detail.
2.1 NEEDS-DRIVEN DESIGN: RESEARCH-BASED PRACTICE AND PRACTICE-BASED RESEARCH

The practice of designing from the inside out, is a needs-driven approach to design where the specific needs of the intended users of a designed object or environment constitute the starting point for its design (Featherston, 2006). This chapter proposes that there is a tradition of designing schools from the inside out, grounded in research-based practice and practice-based research, within which Featherston’s designs for Bialik and Wooranna sit. Significantly for this study, designing from the inside out prioritises interior design over architecture because the interior environment is designed before the architectural form. In other words, the building is designed to accommodate the interior settings. This is a reversal of the conventional practice of designing school buildings from the outside in. As the school design projects under review in this chapter demonstrate, schools designed from the inside out are characterised by rich and diverse interior environments, which current school building reform programs aspire to.

This chapter examines the new cultures of learning that Bialik and Wooranna were developing and nurturing, and the old ones they sought to leave behind. Evidence pieced together from interviews with the schools’ pedagogical leaders and the documents that constituted the design briefs for Featherston’s interior designs is used to articulate those new cultures. Including the learning relationships that the schools’ leaders wanted children to develop with their peers and with their teachers, as well as the professional relationships they wanted teachers to develop with their colleagues. Edward Hall’s (1966) highly influential theory that built environments are products of the cultures within which they are constructed is used to argue that the physical environments Featherston designed at Bialik and Wooranna were ‘products’ and ‘expressions’ of the new learning cultures that each school was trying to foster.
As contemporary exemplars of pedagogical and design innovation Bialik and Wooranna are part of the conversation, in Australia and internationally, about the relationship between pedagogy and design. They are also part of a conversation about innovative school design that has deep historical roots. This chapter locates Featherston’s work at Bialik and Wooranna within a long tradition of design collaboration between progressive educators and innovative designers, and in particular two exemplars that produced new design patterns for school buildings and interior settings, which expressed new learning cultures: Crow Island School, 1940, Winnetka, Illinois, USA, designed by American architect Lawrence Perkins in collaboration with Carlton Washburne, Superintendent of Schools, and Eveline Lowe Primary School, 1966, London, England, UK designed by British architects David and Mary Medd in collaboration with Christian Schiller, Staff Inspector for Primary Education.

However, the intention is not to make an historical argument, but rather to show that a needs-based approach to school design, stemming from a Modernist concern for human experience and functionalism, was shared by Featherston, Perkins and the Medds. They all made detailed assessments of the needs of children and teachers as the starting point for their designs, and they all observed teachers working with children to develop new education practices. They all developed new patterns of spatial organisation and new furniture types, and they all learned from watching how teachers and children used the design prototypes they made. Through these processes Featherston, Perkins and the Medds all contributed to a design methodology grounded in research, much of which they conducted as part of their design practice in schools. This discussion teases out why an intimate knowledge and understanding of school routines by architects and designers is critical to designing child-centred learning environments that are geared towards learning by doing, and how bringing education and design expertise together can result in the co-evolution of pedagogy and design.

The design developments at Bialik, Wooranna, Crow Island and Eveline Lowe highlight the significant roles that research oriented designers such as Featherston, Perkins and the Medds can play in identifying the physical, psychological and cultural needs of users: children, teachers, parents and community. Through needs-based design processes these designers were able to illuminate the interconnectedness between human experiences and relationships, and the physical contexts in which they occur. Which led to the development of new interior design patterns for ‘entry galleries’, ‘group academics’, ‘homes’ and many more. With the assistance of Alexander et al.’s seminal text *A Pattern Language: Towns, Building, Construction* this chapter reflects on some of the design patterns developed by
Featherston, Perkins and the Medds and the practice of using them, known as pattern language. This discussion sets-up the secondary aim of this research, which was to identify and document the interior design patterns embedded in the case neighbourhoods at Bialik and Wooranna.

2.2 TWO SCHOOLS AND ONE INTERIOR DESIGNER
Edward Hall’s theory of proxemics defines human use of space as a specialised elaboration of culture. He argues that the indoor and outdoor spaces we create are products of the culture in which they were constructed. Therefore they are built expressions of that culture and convey cultural attitudes and beliefs through their design. E. Hall’s (1966) argument makes it possible to consider Featherston’s design collaborations with Bialik and Wooranna as processes of cultural construction. It is also possible to read the physical environments they created as built expressions of the learning cultures each school developed. Similarly the Bialik Years 6 teachers’ efforts to modify their physical environments can be understood as an attempt to displace conventional assumptions that teachers hold knowledge and children are passive learners (Fisher, 2005a; Lippman, 2004b; Upitis, 2014), which are deeply embedded in the design of the cellular classroom.

E. Hall’s (1966) argument that space is culturally constructed uses a broad definition of culture as belonging to a particular language group or nation. Here though, the focus is on the transnational culture of Western education, and the particular learning cultures that belong to the individual school communities of Bialik and Wooranna. E. Hall argues that people use space in culturally specific ways that change with time and culture. The learning neighbourhoods at Bialik and Wooranna demonstrate how conventional school spaces produced by Australia’s dominant education culture were reimagined and redesigned to suit the alternative pedagogies the schools were developing.

Equally important are Featherston’s design collaborations with Bialik and Wooranna because they reveal the cultural processes through which the neighbourhoods were designed and Featherston’s role in shaping interior environments as expressions of the learning cultures they were designed to support and promote.

2.2.1 Designing for and with Children - Mary Featherston
Interior designer Mary Featherston in partnership with her late husband, furniture designer Grant Featherston, is an important figure of Australian Modernism. Their research-based design practice was driven by the Modernist belief in social transformation through design. Central to their belief that good design can improve the lives of ordinary people was their commitment to a functionalist ideal of design grounded in a detailed understanding of human needs. They studied and observed
human activity and behaviour to understand the needs of users, which were the starting point for a user-centred design process. Mary Featherston’s contemporary school design practice is similarly user-centred because it is informed by the same Modernist philosophy as her earlier work with Grant. Arguably she has been designing learning environments since the 1960s in the form of art gallery interiors, talking expo chairs, childcare centres, museum exhibitions, and schools.

Featherston’s first design collaboration with children was for *Everybody*, an exhibition about the human body at the Melbourne Children’s Museum in the 1980s. Part of her role as exhibition designer was to mediate between children’s wants and needs. She talked to children to discover what they wanted to know, and she talked to experts, including scientists, medical professionals and exercise physiologists, to discover what they thought was important for children to learn. The overlap formed the content of the exhibition. Children were keen to see human organs, and the experts suggested that children needed to learn how to look after their bodies. Featherston’s studies of learning and child development told her that children are instinctively driven to make sense of the world around them. So the design challenges were to present the information in an interesting and engaging way and to give children the resources and time to make sense of the information for themselves.

Featherston recognised a disparity between environments, like museums, which invited learning through discovery and exploration, and schools where children were being coerced to learn. This led her to consider how to design engaging school interiors that would give children variety and choice in their learning. The publicly funded Victorian schools she began working with had, and have, freedom to develop education programs to suit their school community. Collingwood College, for example, offers a dedicated Steiner stream from Prep to Year 12 and a Reggio Emilia inspired primary program. Victorian state schools can determine their organisational structures, such as Spensley Street Primary School’s multi-age communities of 90 children from Prep to Year 6 who work with teams of four teachers in four separate learning areas. State schools may also deliver the curriculum as they wish provided they meet the prescribed content and achievement goals set out by the Victorian Essential Learning Standards (VELS). Wooranna, for example, uses an integrated model where core curriculum areas and skills are achieved through learning investigations rather than explicit teaching. These factors created possibilities for pedagogical and design innovation at Wooranna, a public school, which were equivalent to those at Bialik, an independent school.
The common bonds between Featherston and the school communities of Bialik and Wooranna are the education philosophies of Reggio. At the heart of Reggio philosophies is the notion of a social collective, where educators work together to continually interrogate the social function of education and children’s role in shaping the society in which they live. For Featherston, Reggio provided confirmation of the ideas she had already been exploring and fueled her desire to influence a more democratic approach to education in Australian schools. In 1992 she was a member of the first Australian delegation of early childhood educators to visit Reggio, led by Jan Millikan, founder of the Reggio Emilia Australia Information Exchange, and in 1994 Featherston designed the Melbourne installation for the first Reggio exhibition to come to Australia, *The Hundred Languages of Children*. Off the back of the *Hundred Languages* exhibition groups of Victorian teachers began meeting after school to discuss strategies for developing Reggio inspired philosophies in an Australian context. Featherston and with members of staff from Bialik and Wooranna were involved in those meetings, which is how they met.

Bialik and Wooranna had different motivations for seeking pedagogical alternatives to conventional teacher-centred education strategies, however the experiences of both schools highlight the inadequacies of the dominant education culture they sought to leave behind. Early childhood educators at Bialik were looking for strategies to encourage children’s natural curiosity and better support them to develop and test their own theories about the world around them. At Wooranna the leadership team was seeking ways to meet the needs of a culturally diverse school community that had equally diverse opinions about the nature and purpose of formal education. The stories of pedagogical innovation at Bialik and Wooranna highlight the limitations of the conventional mode of education that focused on the delivery of information by teachers and the acquisition of knowledge by children. They also clearly articulate the child-centred learning cultures each school community sought to foster.

2.2.2 In Search of a Whole School Philosophy - Bialik College

Bialik College is a private Jewish Day School in inner eastern Melbourne. Originally established in 1942 as a Zionist Sunday School and kindergarten, it now has a student population of approximately 1100 children from three-year-old kindergarten to Year 12. Bialik’s education philosophy is informed by Reggio ideas and *Cultures of Thinking*, a research project co-authored by Bialik College and the Harvard Graduate School of Education’s Project Zero research group. In conjunction with its general studies program Bialik runs a specialist Hebrew language and cultural studies program. Aware of the significance attributed to the physical environment by Reggio educators, the Bialik school community sought Featherston’s assistance to shape the interiors of their new
Early Learning Centre (ELC) that would help them to exploit the potential of the built environment as ‘the third teacher’. Together they developed a child-scale, modular furniture system.

The ELC opened in 1999 as a stand-alone facility for children aged three to seven. Architect Ron Unger’s design makes clear references to the Reggio centres in Italy that he visited with Head of the ELC, Sonia and Head of the Primary School, Pam. Each floor of is structured around a central plaza, shown in Figure 2.1 similar to Reggio’s piazzas, eliminating the need for corridors and making circulation space available for learning activities. The ground floor houses the reception and administrative offices, documentation room, art room, kitchen, kinder dining space, and three and four-year-old kindergarten rooms and bathrooms. The upper floor houses a library, music room, staffroom, preparation room, art and technology studio, Prep homerooms, Year 1 homerooms, and toilets.
The small and compact homerooms, shown in Figure 2.2, reflect the size of their child occupants. Each homeroom shares a withdrawal room, Figure 2.3, with its neighbour and has its own mini-studio, Figure 2.4 modeled on Reggio’s ateliers, for wet, messy activities. The studios protrude into the plaza creating child-scale alcoves and pockets at the fringes, Figure 2.5. Another reference to Reggio centres is the extensive use of internal glazing, which creates strong visual connections between homerooms and studios, and between the plaza and the learning spaces that open onto it. A glass atrium in the centre of the upper plaza brings light into the centre of the lower plaza. An indoor conservatory at one end of the building contains a tropical rainforest with frogs and tadpoles.

Prior to construction of the ELC the children and teachers had been working in an old National Trust Home, each class group in a separate room. The spaces were small and cramped and not conducive for learning investigations or for teachers working together. It was in these spaces that Sonia, inspired by Reggio, began to work with her teachers to develop their own child-centred philosophy. They wanted to move away from teacher-led and teacher-directed activities that focused on skill development and learning outcomes, such as writing letter forms or pattern recognition, towards helping children learn more about the things that they were interested in and curious to know. Featherston observed the children and teachers working with their new philosophy in the old school buildings to understand their routines, activities and working groups.
The teachers described the different kinds of learning experiences they wanted children to have including maths problem solving, written and visual communication, performance and role-play, story telling and reading, making and listening to music, science experiments, art investigations, play, rest and relaxation. Using these experiences as a starting point Featherston and the teachers determined that children needed task-specific seating and work surfaces, places to store and display their work, and easy access to tools, materials, technologies and services particular to their activities. Through this collaborative process a design brief for multiple small learning settings, each with its own specific requirements emerged. To help teachers create settings to accommodate each experience and the tools and resources required Featherston designed a modular furniture system, which she conceived as an extension of the ELC’s interior architecture.

She made scale models to demonstrate to teachers how a custom designed, modular furniture system could be used to create a wide variety of learning settings. Together they evaluated the models and tested the furniture prototypes. The final designs were manufactured in clear finished medium density fibre board (MDF), an inexpensive, warm, honey coloured material that helped create a neutral background for children’s work and activities. The core elements of the system are high and low storage units linked together with rectangular table-tops, Figure 2.6. These elements can be customised by adding interchangeable components, including mirrors, a half round table, book display, and a reading/drawing ledge, to create individual learning settings. IKEA timber stools were used to complete the system. Other elements Featherston designed include a nook, play screen, easel, trolley, light box, podium, play box, carpet steps and a child-scale couch, plus 15 specialised pieces including a 3D display case and large paper storage shelves. The logic of developing a modular furniture system was to provide a kit of parts for each teacher to use to customise the layout of her homeroom according to children’s activities and her own teaching preferences.

Figure 2.6 - Modular Furniture System
Bialik Prep Neighbourhood
In both form and function Featherston’s modular furniture system reflects the child-centred philosophies and collaborative culture of learning that Sonia and the ELC teachers were carefully creating. The small-scale and variety of pieces in the system suited the physical development of young children and their various working postures, including standing, sitting, and lying down. The form and placement of the 1200mm high storage units were expressions of teachers’ new role and their new relationship with children. No longer able to survey the room teachers were encouraged by the new furniture and layout to move from setting to setting facilitating children’s various activities, and children were trusted to work independently away from the teachers’ constant gaze. The image of children as curious, capable, intelligent and independent learners was also reflected in the open shelves of the storage units that were filled with games, materials, books and resources, which children selected for themselves.

To assist teachers with the layout of their rooms Featherston developed a detailed manual that showed what configurations were possible and how to create them. In this sense she designed not only the furniture, but also the spatial organisation of the ELC interiors. The manual encouraged teachers to think spatially about the specific needs of their home groups and guided them in using the modular system to create clearly defined settings for particular activities. Using the modular system gave teachers opportunities to develop a working understanding of their spaces as the third teacher, and how they could be organised and resourced to provoke opportunities for exploration and discovery. Because storage space was integrated into the furniture pieces the system helped teachers to communicate the purpose of each setting to children via the tools, resources, materials and equipment stored there. Through these processes of selection and presentation the Prep teachers who participated in this study were helping weave the material culture of their neighbourhood.

**FIGURE 2.7 - Logos and Flags**

Vanessa’s Homeroom, Bialik Prep Neighbourhood
In the new spaces teachers continued to be keen observers of children’s learning strategies, taking cues from them about when to prompt or question and when to provide time and space for children to work something out for themselves. Reggio educator Carla Rinaldi (2009) describes the teacher’s role as that of a researcher in the company of child researchers. During this study Prep teacher Vanessa’s home group were exploring the concept of ‘identity’, through graphic representations in corporate logos and national flags, see the photos in Figure 2.7, in preparation for designing their own class flag. The children were interested in the symbolic, emotional and optical value of colour and how this might influence their choice of colours for their own flag. In what appeared to be a spontaneous response to children’s questions about colour their assistant Justine took them on a tour of the school’s art collection guiding them in an exploration of how different colours made them feel and prompting them to consider how one artist used colour to create depth in her work. This side exploration of colour demonstrates the highly responsive nature of the teachers’ pedagogical practice to children’s interests and their readiness to provide stimulus for further exploration. According to Rinaldi working this way helps teachers learn, by observing children’s learning strategies, how to be better teachers.

Following the success of Bialik’s ELC Principal Kevin and Director of Teaching and Learning, Kay together with Pam and Sonia wanted to extend the philosophy of child-centred, deep and collaborative learning enquiry throughout its primary and secondary years. The challenge was finding an appropriate model, because teachers outside the ELC believed that Reggio ideas were only for very young children. The answer lay in a five-year partnership with Project Zero researchers on a project called Cultures of Thinking. Together they created a suite of thinking routines geared towards developing children’s metacognition. Drawing children’s attention to their individual learning styles and strategies enabled them to consciously shape their own learning experiences because
they knew what worked best for them. The Year 6 teachers who participated in this research suggested that the nature of child-teacher relationships had begun to change. Less inclined to be ‘the teacher at the front of the room’ they were more comfortable playing a mediating role in child-led discussions. For children learning was becoming a joint venture as they contributed to a shared body of knowledge and learned new strategies for learning from their peers.

The Year 6 neighbourhood was on the second floor of one of Bialik’s original 1970s buildings and consisted of three cellular classrooms and a shared corridor space. Figure 2.8 shows the low ceilings, grey blue carpet, royal blue pin boards, off white walls, and beige institutional furniture that created a cool atmosphere in each of the Year 6 spaces. Fluorescent strip lighting supplemented natural light from the north-facing classroom windows, but neither the classrooms nor the corridor were brightly lit. Inspired by conversations with their Cultures of Thinking study groups the Bialik Year 6 teachers visited Wooranna to see how its conventional classroom spaces had been transformed into learning neighbourhoods. In the corridor outside their homerooms the Bialik Year 6 teachers arranged surplus tables and chairs to create a shared collaborative learning space, shown in Figure 2.9. Their modifications were modest, but nonetheless significant because they signaled the development of a new learning culture.

The modular furniture system that Featherston developed for Bialik subsequently went into small-scale commercial production and was available to other schools. For Featherston’s ongoing school design practice the modular furniture system became the foundation of a much larger enquiry into how the interiors of pre-existing buildings could be customised to create multiple, diverse and interconnected learning settings and
large collaborative learning neighbourhoods. The most striking example of which is her design and research collaboration with Wooranna Park Primary School.

2.2.3 Igniting The Fire Within - Wooranna Park Primary School

Wooranna Park Primary School is a state government-funded school in the outer south eastern suburbs of Melbourne that opened in 1971. Its student population of approximately 370 children from Prep to Year 6 represents more than 40 nationalities and a wide variety of social and cultural backgrounds. Wooranna is classified as a socioeconomically disadvantaged school, but this has not been a barrier to high academic achievement. Wooranna’s education philosophy, like Bialik’s, is informed by Reggio ideas as well as George Betts’ autonomous learner model. It is also heavily influenced by Howard Gardner’s theory of multiple intelligences and Barbara Rogoff’s development of Vygotsky’s sociocultural theory. Cultural diversity is celebrated at Wooranna and children are encouraged to learn about their own backgrounds and share them with the rest of the learning community.

The course of pedagogical change at Wooranna was set by the determination of Principal Bryan and Assistant Principal Louise to meet the intellectual, social, emotional and cultural needs of its diverse school community. At the beginning of this journey Wooranna’s undifferentiated curriculum meant that all the children in each year level did the same activity at the same time, and their lives and experiences outside school were not acknowledged at school. Inspired by their success running workshops for gifted and talented children Wooranna’s leaders began to develop an education philosophy that celebrated the skills, capabilities and life experiences of all children. They faced considerable challenges, not least of which was winning and maintaining the support of the school community whose opinions about the role of school were as diverse as their cultural backgrounds. Pedagogical innovation meant questioning everything about their existing practice including Wooranna’s organisational structures, its timetable and children’s access to specialist resources.

Braggett (1985) argues that rather than withdrawing gifted and talented children they should be catered for in the classroom environment by providing a broader variety of learning activities for all children. Rogoff (1990) develops the concept of guided participation, which builds on Vygotsky’s sociocultural theory to suggest that because learning is the product of social interaction education ought to be a social project. Gardner’s (1999) theory of multiple intelligences suggests that each learner has individual learning dispositions and Betts’ (1992) autonomous learner model encourages children’s development as self-directed learners. Finally, Maliguzi’s notion of the hundreds of
languages of children, which underpin Reggio’s child-centred pedagogy, refers to the limitless forms of expression children use to explore and communicate their ideas.

These theories were embodied in Wooranna’s decision to develop an integrated and differentiated curriculum that engaged children in collaborative hands-on learning experiences designed to help them develop skills in all modes of learning. Children had access to a wide variety of tools, materials, technologies and equipment, and selected what, where, when and how they learned. They also assisted each other to develop and extend their skills and capabilities by co-constructing knowledge. Like Reggio’s progettazioni Wooranna’s learning investigations began with one big idea through which core subject areas, such as Maths and English, were delivered as part of the investigation. Wooranna’s organisational structures changed to support these new modes of learning including the shift to team teaching to facilitate a greater variety of learning experiences, and the introduction of 90 minute periods referred to as ‘Learning Agreement Time’ (Capp, 2005) to give children more unbroken time for their investigations.

To support their pedagogical innovations and new learning and teaching practices the school community began experimenting with remodeling the existing 1970s light timber construction school buildings that consisted of a low central corridor with a row of cellular classrooms on either side. They removed non load-bearing walls to link classroom spaces together, and they introduced second-hand office furniture to break down conventional classroom dynamics and encourage more democratic learning and teaching relationships. Previously each child had a singular relationship with one teacher, now each child has relationships with at least three adult mentors. After having worked in these self-modified environments for seven years the school community had not achieved its goal of changing its culture of learning and in 2003 it approached Featherston for design assistance.

Featherston spent many hours with Bryan and Louise discussing pedagogy and establishing a shared vision. Together they developed Wooranna’s La raison d’être document (Capp, 2005), which articulates the school’s educational principles, beliefs and practices. This document drove the design brief for the Years 5/6 learning neighbourhood refurbishment that was achieved with funding from the Victorian State Government for a five-year action research project called the Inside-Out Project, which set out to investigate four central design questions:

What is the role of the physical environment in contemporary schooling?
How can design support a dynamic, responsive approach to learning?
Is it possible to create an amiable, aesthetic environment which is also
full of rich and complex possibilities for learning?

What is an effective participatory design process? (Featherston, 2006)

The participatory design process was structured as a term-long learning investigation like those that children would be conducting when the neighbourhood refurbishment was complete. The process also reflected the democratic culture that Wooranna was trying to develop by involving children in the process of design decision-making.

Featherston worked with the Years 5/6 children to assess their existing learning activities and identify what they wanted to do differently. For example, they wanted tablet chairs in the classroom/workshop, shown in Figure 2.10 (left), so they could reconfigure it for different activities, including facing the screen for AV presentations, and sitting in a large circle for group discussions. Using this information Featherston developed a chart of experiences, relationships and group sizes together with a list of learning settings and a map of the proposed distribution of children and teachers throughout the space. She developed 10 learning settings that she organised to create an interconnected neighbourhood equivalent to six classrooms plus a central corridor. Downstairs was a raised platform for construction and games, a bright and spacious studio-laboratory for art and science, a lounge for socialising and relaxation, areas for collaborative study, a multi-media hub for animation, printing, programming, and scanning, as well as partially enclosed settings for small group discussions and targeted teaching, there was also a large black-out space for movement and performance and within it a compact sound recording studio. A drinking fountain and a small snack table were located at the foot of the stairs. Upstairs was the classroom/workshop, complete with tablet chairs, and beside it a separate space for quiet study and reading.

![Figure 2.10 - Tablet Chairs (left), Down Stairs South Side (right)](image)

Wooranna Years 5/6 Neighbourhood

Each design element and interior detail of the Years 5/6 refurbishment conveyed the child-centred democratic culture that Bryan and Louise had imagined. The interior spaces
were warm and welcoming with living plants and fish, and plenty of display space so that children would be able to see themselves and their stories reflected in teachers’ displays. The furniture was child-scale and pieces such as the red sofa and ottomans, pictured in Figure 2.10 (right), introduced the comfort of home. Wooranna’s image of children as autonomous, independent learners is evident in the furniture configuration of the small group discussion setting, coloured yellow on the plan Figure 2.11, where the banks of 1600mm high lockers that enclosed the setting were too high for teachers to see the activities of children seated on the other side. Democracy and trust are also expressed in Featherston’s design for lockers without locks that had passport photos rather than name tags to identify their owners. Her use of colour, texture, materials and light all embodied the respect shown to children’s work as evidenced by the location of particular settings. For example, the multi-media hub, coloured green on the plan, is centrally located downstairs away from solar glare, whereas the studio-laboratory, coloured blue, is on the brightly lit north side of the building. Abundant natural light enabled children to accurately mix paint colours and the washable flooring permitted them to make a mess. Each piece of furniture Featherston designed or selected, such as the ergonomic Pantoflex™ chair Figure 2.12, was a concrete expression of the consideration she gave to children’s comfort and physical wellbeing.
Owing to an extremely short construction deadline for the Wooranna Prep refurbishment, Featherston’s consultation with children and teachers was brief. Therefore her design was an extension of the ideas developed at Bialik and in the Wooranna Years 5/6 neighbourhood. It included some fixed architectural elements, similar to the Years 5/6 neighbourhood, as well as a number of moveable, modular components similar to those designed for Bialik. This combination gave the Wooranna Prep teachers flexibility to reconfigure some settings and certainty that others did not need to change.

Visually harmonious interiors, like those in the Years 5/6 neighbourhood, were achieved by consistent use of colours, textures, materials and lighting to create a unified visual language. The walls were painted white to reflect abundant natural light making the interiors light, bright and inviting. Deep sand coloured carpet, blonde wood timber stools, white laminate work surfaces and clear finished MDF storage and display units all contributed to a neutral colour scheme, punctuated occasionally by bold red and orange to highlight specific learning settings, such as the reading loft, shown in Figure 2.13.

The Wooranna Prep neighbourhood was equivalent in size to four classrooms plus a low central corridor. The walls that once separated the classrooms had been removed along with large sections of the corridor walls, as the plan in Figure 2.15 shows. Part of the corridor became the entry-gallery, where white walls and carefully focused lighting drew attention to children’s work hung on the walls and presented in Perspex display cases, Figure 2.14. At the far end of the corridor was a cloakroom with sliding-door access from either side. In between was a small black-out space and a role play vehicle for imaginative play. Featherston used tall shelving units, T-screens, play-screens, trolleys, podiums, and loose furniture to organise the uncommitted space to the left of the entry gallery into learning settings. The learning settings in this space included a large area with clusters of tables and stools for maths problem solving, a string of very small settings for dress-ups and role play, a setting with shelves full of materials plus flat surfaces for
small-scale construction, and a big unobstructed space with foam blocks for large-scale construction.

To the right of the entry gallery two partially glazed walls enclose a setting for target teaching. Nearby bright orange curved walls encircle a two-level reading loft and an amphitheatre for AV presentations. Other settings for computing and communication, and a studio-laboratory were defined with loose furniture including tables, chairs, easels, and shelves containing art materials. There was also a drinking fountain, materials store, and a small lounge beside the entry gallery where parents waited to collect their children.

As in the Years 5/6 neighbourhood every design element and interior detail of the Prep refurbishment conveyed Wooranna’s child-centred and democratic culture. But in the Prep neighbourhood scale was the most powerful reminder of the neighbourhood’s inhabitants. The architectural volumes were large, but the proportions of each setting and the furniture were scaled to suit five and six-year old Prep children. Also the abundant resources were presented on shelves and surfaces at child height reflecting Wooranna’s image of Prep children as curious, capable and autonomous learners, Figure 2.16.
The interior environments that Featherston designed at Bialik and Wooranna are material expressions of the new learning cultures the schools were continuing to develop. In other words they are examples of E. Hall’s theory of culturally constructed space. E. Hall argues that “communication constitutes the core of culture” (E. Hall, 1966, p. 1), and that culture only exists as an expression in the ways that people behave and interact and in the things that they make and use. He makes reference to Sir Winston Churchill’s often quoted comment that “we shape our buildings, and afterwards our buildings shape us” to develop his argument that as well as being products of culture, the spaces we create also shape culture. This argument is significant in relation to Bialik and Wooranna because it is a reminder that the purpose of redesigning the neighbourhoods interiors was not just to support the schools’ alternative learning cultures, but also to promote them. The design intent was to encourage new behaviours and practices to develop and be sustained, such as team teaching and collaborative learning relationships.

As pedagogical and design exemplars Bialik and Wooranna have been responsible for promoting alternatives to the conventional culture of education typified by the cellular classroom and its didactic pedagogy. Wooranna in particular has attracted widespread attention from architects, educators and university researchers (Calzini, 2007; Gehling, 2009; Capp, 2004; O’Loughlin, 2003; Walker, 2006), and extensive coverage by architecture and education media (Reddy, 2004; Ryan, 2009). It was a participating school in DEECD’s Next Practice Program to stimulate, incubate and accelerate future education practice in Victoria, and Featherston was involved as a design expert sharing the lessons of Bialik and Wooranna. The design of Wooranna’s Years 5/6 neighbourhood was shortlisted for the 2006 Victorian Premier’s Design Awards, and judged best refurbishment under $1 million by CEFPI Victorian in the same year. Publication of the ‘Inside-Out’ Project (Featherston, 2006) online brought Wooranna to a wider audience inspiring developments at other pedagogically innovative schools including Robin Hood Primary School in Birmingham, UK. Bialik has also received international attention via the publications that came out of Cultures of Thinking (including Ritchhart & Perkins, 2008; Ritchhart, Palmer, Church & Tischman, 2006; Ritchhart, Turner & Hadar, 2009).

2.3 SEEKING SCHOOL DESIGN PATTERNS

The primary aim of this research was to discover whether or not the interior environments Featherston designed at Bialik and Wooranna were successful in supporting and promoting the new learning cultures the schools were shaping. In other words whether they functioned as they were designed to. This research also investigated the ways interior design was used to communicate the new cultures and desired behaviours and practices to children and teachers. The secondary aim of this research was to identify and document design patterns...
within the case neighbourhoods as the foundation for a pattern language for school interiors. Design patterns are an architectural concept used to describe collections of physical attributes that are repeated over and over in our built environment, hence ‘pattern’. They are the fundamental building blocks of architectural design used by architects to create designs for built environments. By identifying and documenting interior design patterns in the case neighbourhood this thesis aims to make the building blocks of new school interiors available to architects, designers and school communities.

The most comprehensive record of Western design patterns was made by architect Christopher Alexander and his colleagues in their seminal publication *A Pattern Language: Towns, Buildings, Construction*. The patterns they document are based on the study of hundreds of built examples and what they describe are the core elements of a particular architectural expression or phenomenon that is recognised and understood by architects and designers, and often by the people who use and inhabit those spaces. The design pattern for a Western church, as discussed in the introduction to this thesis, is one such example. The core elements of the design pattern for churches are the cross, tall narrow windows, and strong vertical elements that reach heavenwards such as spires, bell towers and steeply pitched roofs, all of which instantly identify such buildings as places of worship. C. Alexander et al. (1977) also include instructions on how to make each pattern, so in fact design ‘pattern’ refers to both senses of the word.

Design patterns, like the spaces they describe, are culturally specific. This is because they are products of the culture within which they were developed, just as the spaces they describe are. Hence the design pattern for a Japanese house is quite different to the design pattern for an American house. They are both patterns for domestic dwellings and they both respond to human needs for shelter, comfort and security, but as E. Hall explains, the spaces these patterns describe are quite different and used in quite different ways:

In Japan, for example, the walls are movable, opening and closing as the day’s activities change. In the United States, people move from room to room or from one part of a room to another for each different activity, such as eating, sleeping, working or socializing with relatives (E. Hall 1966, p. 104).

Similarly the design patterns for learning neighbourhoods at Bialik and Wooranna were not the same. The Bialik Prep neighbourhood was composed of homerooms and separate specialist rooms linked together by a shared plaza space. Whereas the Prep and Years 5/6 neighbourhoods at Wooranna were fully integrated environments of interlinking learning settings for particular purposes, including specialist activities. These patterns reflect the particular cultural construction of ‘learning communities’ at each school. Bialik’s learning communities were collections of separate home groups that came together for some
activities, whereas, Wooranna’s learning communities worked together all the time in various groups of different size and composition.

This research sought to discover the smaller interior design patterns that fit together to make the patterns for learning neighbourhoods. These may constitute a design vocabulary for school interiors. C. Alexander et al. equate their design patterns to words in a written language. They describe using a pattern language as the process of assembling patterns to formulate a design “beginning with the very largest [patterns], for regions and towns, then working down through neighbourhoods, clusters of buildings, buildings, rooms and alcoves, ending finally with details of construction” (C. Alexander et al., 1977, p. xii). Which means that built environments are the result of successive layering of smaller and smaller design patterns right down to the smallest interior detail. This is the reverse of Featherston’s interior design practice of designing from the inside out starting with the smallest details required to meet a specific human need, such as the provision of pencils and paper for drawing, and then moving outwards through progressively larger interior design patterns to create learning settings and eventually neighbourhood environments.

In Chapter 5 this thesis proposes an inverted pattern language that mirrors the process of designing from the inside out by starting with the smallest design patterns for loose items progressing outwards to furniture; services, facilities and digital technologies; walls, floors and surfaces; physical characteristics and spatial organisation; learning settings; and finally learning neighbourhoods.

The re-discovery of design exemplars like Crow Island and Eveline Lowe that have come to light via the work of education historians including Catherine Burke, Ian Grosvenor and Martin Lawn, and architects and academics such as Mark Dudek and Herman Hertzberger, has prompted architects and designers to re-examine historical school design patterns as sources of inspiration for designing twenty-first century learning environments. For this research Crow Island and Eveline Lowe are significant because they are rare examples of schools where the details of their interior design are known and well documented. The spatial patterns, furniture types and interior furnishings they contain are important examples of patterns, proposed in the past, as alternatives to conventional classrooms and corridors. Even more importantly they are products of design processes driven by detailed studies of children’s needs and new teaching practices, as such they are concrete expressions of the child-centred cultures of learning they were designed to support.
2.4 HISTORICAL EXEMPLARS

Burke describes designing from the inside out as “a scientific and artistic process” that emphasised “the importance of following sound research-based principles and not the latest fashions or fads” (Burke, 2009, p. 433). By researching, observing and analysing new learning and teaching practices innovative architects, including Larry Perkins, Mary Medd and David Medd, were able to disrupt the homogeneity of the cellular classroom by developing multiple learning settings and environments that addressed children’s specific needs related to a variety of desirable learning experiences. While practicing at different times and in different countries their design practices were informed by international Modernism and functionalist ideologies that drove the establishment of architecture and interior design as modern design disciplines. They each recognised that via a research-based, user-centred design process it was possible to design learning spaces and settings that would stimulate children’s curiosity and desire to learn, as well as providing opportunities for them to exercise choice and make decisions. The settings they developed also suggested possibilities for teachers to extend and develop their innovative practice. These design innovations were only possible because of detailed professional exchanges between educators and school designers and their shared commitment to accurately identifying users’ needs and rigorously testing proposed design solutions.

2.4.1 Crow Island and the L-Shaped Classroom

Crow Island Elementary School, 1940, Winnetka, Illinois, USA was the result of collaboration between Superintendent of Schools Carlton Washburne and architect Lawrence Perkins in partnership with architect Eliel Saarinen and his son, architect and industrial designer Eero Saarinen. Perkins worked for a young private architecture practice and his appointment as architect for Crow Island was conditional on securing the Saarinens’ involvement in the project. It was a significant project, not least because Washburne, the educator in the collaborative partnership, was acutely aware of the importance of school design as evidenced by his careful explanation of what the architectural expression of Crow Island School should be:

The building must not be too beautiful, lest it be a place for children to keep and not one for them to use. The materials must be those not easily marred, and permitting some abuse. The finish and settings must form a harmonious background [to] honest child effort and creation, not one which will make children’s work seem crude. Above all the school must be warm, personal, and intimate, that it shall be to thousands of children through the years ‘my school’. (Burke & Grosvenor, 2008, p. 102).
For one year Perkins observed children and teachers working in their conventional classroom settings to assess their activities and behaviours. He described himself as both student and teacher, watching and plotting children’s actions, observing, programming, studying, reading, telling stories and talking to people to understand what children and teachers already had and what they needed. From his research and direct observation Perkins identified six kinds of school activities that drove his architectural plan: individual academics, group academics, individual activities, group activities, dealing with and storing clothing, and toileting. He described the significance of Crow Island’s L-shaped rooms as “the rejection of the rigid [twenty-four, by thirty-two, by twelve foot] conventional classroom…. predicated on thirty students, five rows of six each with fixed desks, twelve feet in front of the teacher’s desk, with the activity and blackboard at the front” (Perkins, 1986, pp. 63-64). The main classroom space occupied the same area as a conventional classroom and in foot of the ‘L’ was a workroom with adjoining toilet and cloakroom, shown in Figure 2.17.

**Figure 2.17 - L-Shaped Classroom**
Crow Island School 1940, Winnetka, Illinois, USA

Analysis of school activities and routines over a period of time enabled Perkins to identify what was needed to support them. Individual academics, for example, he defined as traditional desk-based activities, such as recitation, drawing and writing, done under direction from a teacher. This setting occupied the main classroom space set back from the windows, but still bathed in even ambient light. Perkins’ design improved the interior reach and distribution of natural light by using small clerestory windows on one side of the room to supplement the light from larger windows opposite. This radical departure from the mandatory ‘light from the left’ rule of conventional school planning was also employed by Richard Neutra in his design for Corona Avenue Elementary School, 1935, Los Angeles, California, USA. Perkins also introduced moveable classroom furniture, shown in Figure 2.18, to replace fixed furniture arrangements typical in conventional classrooms at the time. He suggested that the variety of spatial arrangements and seating...
patterns teachers created using the moveable furniture were responsible for breaking down previously authoritarian and confrontational teacher-child relationships because they encouraged greater interaction between children and their peers and enabled the classroom interiors to be organised into discrete, interconnected learning settings.

Group academics were informal activities that the whole group did together. Built-in seating in the bay window with a view out into the playground was all that was needed to create a place for young children to sit together to listen to a story, and a place for older children to hold a class discussion. Whereas individual activities required special tools, facilities and furniture organised within a largely enclosed setting. This was because individual activities were personal investigations, specific to the different interests of individual children. They were often wet and messy and sometimes loud and noisy. Perkins gives two examples: a young child “hammering nails through two shingles to make an airplane” and an older child “holding a Bunsen burner under a test tube of copper sulfate to make it lose its blue color and regain it by putting the water in” (Perkins, 1986, p. 60). Children needed access to water, to benches so they could work standing up, and to chairs and tables for working sitting down. They also needed places to store their
work as it dried and to display it for others to see. For these reasons the workshop space was located in the foot of the ‘L’ separate from the main classroom space.

The less well-lit area of the main classroom space was kept free of obstructions and used for group activities, which were collaborative, experience-based and designed to engage children in learning through play, movement, performance and dance. The example Perkins gives is of a train the children created out of orange crates. Their teacher asked, “Will we go to Rockford? Well, where’s Rockford?” (Perkins, 1986, p. 60). From these questions, Perkins explains, a journey began out of which developed a geography lesson, and a lesson in transportation, and all the while the children were physically engaged in riding their orange crate train.

Burke and Grosvenor suggest that the process of designing from the inside out, as Perkins did, produces “an architectural humanism characterised by an interest in the behaviours, feelings and aspirations of the people inhabiting the buildings” (Burke & Grosvenor, 2008, p. 129). This was evident in the use of materials and the scale of the Crow Island interiors, which attended to the physical, psychological and cultural needs of children. The combination of natural and industrial materials used reflects the influence of Eliel, Eero and Lillian Saarinen and a Scandinavian Modernist design aesthetic (Frith & Whitehouse, 2009). The warm and functional environment created by timber furniture, wall panels and open shelves was further humanised with pot plants and vases. The classroom doors were painted different colours to help children navigate without room numbers, the ceilings were 9ft rather than 12ft high to establish child-scale spatial proportions, and door handles, toilet seats and blackboards were positioned at child height, Figure 2.18. Such Montessorian concerns for children’s comfort and physical development (Dudek, 2000) are also reflected in the design of Eero Saarinen’s child-scale, ergonomic moulded plywood tablet chair with built-in storage.

Perkins also paid deliberate attention to children’s other school routines such as managing their clothes and toilet. This demonstrates a holistic consideration of children’s school experience and acknowledges that these tasks are as much a part of school life as learning activities. His architectural plan incorporates toilets and cloakroom in the foot of the ‘L’ so that children’s toilet interrupted their learning activities as briefly as possible. Perkins also determined that each class group should have direct access from their classroom to the outdoors, so logically the design of the classrooms directed children through the cloakroom as they moved to and from the outdoor playground.
Perkins’ architectural plan for Crow Island has been criticised for separating general learning areas and specialist facilities, such as the library and art room. The criticism was that “art should be an integral part of education and not limited to a special room in the building for an hour a week” (Perkins, 1986, p. 68). Perkins’ response was that the same argument could be made about music and that it was simply not possible to include facilities for every specialist activity in the classroom plan. Despite this criticism, Perkins’ design for Crow Island was, and is, a significant design exemplar because it disrupted the design pattern for conventional classrooms by introducing some specialist facilities into the classroom unit in addition to separate specialist facilities for art and music. Considered in the broader context of the development and evolution of school design, Crow Island is midway between the conventional architectural plan for schools and holistically designed learning neighbourhoods such as those at Eveline Lowe Primary School.

2.4.2 Eveline Lowe and Homes at School

Eveline Lowe Primary School, 1966, London, England, UK was the product of collaboration between the inner London Education Authority and the Architects and Building Branch of the Department of Education and Science. The architects David and Mary Medd were leading members of a team employed to design the school. Louis Christian Schiller, Staff Inspector for Primary Education, was committed to nurturing good teaching practice wherever he saw it and as Burke (2013) points out, he directed Mary Medd and David Medd (nee Mary Crowley) to visit innovative teachers who represented what he later referred to as ‘growth-points’ in education practice to see what children and teachers “were doing, the materials they were using, the groupings and the comings and goings; the imaginative, ingenious arrangements and the improvisations of space and equipment, the home-made bits and pieces; the animals and plants, [and] the displays of children’s work” (Medd & Medd, 1972, p. 7). Mary’s passion for learning, through observation, what children and teachers needed in the physical environment was subsequently shared by her husband and professional partner David Medd. Together they collaborated with Schiller to produce many schools from within the Ministry of Education (later Department of Education and Science) between 1949 and 1972.

Developing first hand knowledge of the users for whom they were designing was key to the Medds’ design practice and they applied what they learned about newly evolving learning and teaching practices at many different schools in their design for the new school, Eveline Lowe. In the schools they visited they discovered that teachers were using conventional school environments “pervasively, with every recess, coat lobby, corridor, landing put to use in an attempt to find the variety of space demanded by the variety of activities going on” (Medd & Medd, 1972, p. 8). Walker (2010) suggests that the Medds
valued working with teachers and LEA school inspectors because both groups regarded teaching as craft knowledge. The Medds developed an understanding of the craft of teaching and how to design environments that respected teaching practice by studying teachers’ spatial experiments. As a result, the spaces the Medds designed were not abstractions but carefully considered environments imagined with children and teachers working there.

An appraisal of Eveline Lowe published by the Department of Education and Science, (DfESc, 1972) describes the pedagogical principles that drove a detailed design process to develop radically different and physically complex learning environments designed to provide children with a variety of learning experiences and relationships. It emphasises the significance of the physical environment as a stimulus for children’s learning, suggesting that young children’s desire for knowledge is innate and that they learn through interacting with their physical environment by engaging all their senses to explore and make sense of the world around them. It also suggests that through play children learn about different materials and ways to use them in self-expression, and that adults play an important role in providing children with the materials they need, listening to their theories about the world and helping to clarify their learning experiences.

Surrounded by high-rise housing, Eveline Lowe was an important social centre for its local community, a place for children to play in safety, and a place for isolated parents to make connections with other people (DfESc, 1972). Burke and Grosvenor (2008) suggest that the social priorities of post war Britain and international concerns about how to renew education as a force for the protection of democracy and a defence against Fascism informed the architecture and interior design of Eveline Lowe. A clustered arrangement of single storey school buildings on a treed and landscaped green fields site gave the school...
plan the impression of a small village. As Figure 2.19 illustrates the architectural design linked the buildings together creating a collection of discrete external courtyards and undercover work spaces, and a series of interconnected interior spaces. Medd & Medd (1972) explain that key to this interlinked plan was a deliberate balance between creating a physical environment that provided a sense of security for individual children within their local neighbourhood zone and encouraged their independence and interdependence with children of different ages throughout the school community.

Working with teachers at growth-point schools enabled the Medds and the teachers to develop common understandings and a shared vocabulary that evolved from their respective design and education practices (Burke, 2009). Rather than “trying to assess the needs of young children in terms of square feet of floor space”, as was conventional architectural practice, the Medds “began to talk of working spaces, noisy spaces, a quiet home place, an environment in which children could explore and live and learn” (Schiller, 1972, p. 5). They developed design prototypes and as teachers used them the Medds observed, analysed and interrogated their designs. In this way teachers’ practice influenced the development of the design prototypes, and in turn the design of furniture and spatial types influenced teaching practice as teachers used them to experiment further with new ways of working with and relating to children. The Medds suggested that this way of working encouraged “education and its environment to unfold and develop as interdependent parts of a single enterprise of first hand exploration and discovery” (Medd & Medd, 1972, p. 8).

The Medds’ school design practice was also informed by the research of others. Mary’s father Ralph Crowley’s theories about children’s physical and psychological wellbeing influenced their concern for the needs of children (Burke & Grosvenor, 2008; Burke, 2013). Similarly the anthropometric surveys David Medd conducted to determine the appropriate scale of furniture for primary school aged children, unprecedented in the UK (Naylor, 1967), were informed by similar studies conducted by Swedish scientist, designer and ergonomic theorist Bengt Akerblom (Burke, 2009). So successful was the furniture range developed by the Medds in conjunction with the Hertfordshire LEA, it was subsequently available to other schools. Also the Medds’ detailed studies of children’s physical needs and capabilities improved the range and general availability of child-scale school furniture.

To create what they describe as ‘built-in variety’ to correspond with the richness of children’s work the Medds developed a wide range of child-scale, mobile furniture and five different learning settings—‘homes’, ‘enclosed rooms’, ‘general work areas’,
‘specifically committed zones or bays’, and ‘covered outdoor work areas’ (Medd & Medd, 1972). They argued that built-in variety was “quite different from providing wide open neutral space with one pervasive character and no definite commitments, in the name of ‘flexibility’” (Medd & Medd, 1972, p. 10). Rather, the learning settings they developed were purposefully designed, modular spatial components, used to structure neighbourhood environments that promoted connections between children’s different learning experiences. Each neighbourhood included specialised learning settings for activities such as art and music in addition to larger, separate art and music rooms. This duplication addressed the criticism leveled at Perkins’ separation of specialist learning facilities and general learning areas at Crow Island.

Central to the Medds’ design for Eveline Lowe were the learning settings they referred to as ‘homes’ that were similar in design concept and social function to domestic homes. ‘Homes’ were constructed around a ‘family’ relationship between a group of children and their teacher. They were soft, comfortable and homely places with wallpaper, floor rugs and informal furniture. The Medds included only a few tables and chairs in each home setting to break any association between homes and conventional classrooms. This created a dual-purpose environment that was a comfortable base for a large group of children, as well as a quiet place for small groups of children to work throughout the day. ‘Enclosed rooms’ were acoustically separate spaces designed to both exclude and contain noise. These spaces were large enough for six to ten children to do quiet work, such as reading Figure 2.20, or alternatively noisy work, such as playing music, without disturbing or being disturbed by children working in other settings. Enclosed rooms were furnished with some tables and chairs for working as well as window seats for reading and informal activities. There were storage spaces for books and equipment and wall display space for children’s work.

![Figure 2.20 - Enclosed Room](image_url)

Eveline Lowe Primary School
Illustration based on a photograph produced in Medd and Medd (1972, p. 4)
‘General work areas’ were uncommitted spaces where large numbers of children worked together in small collaborative groups. They were fluid, malleable spaces, furnished with a range of mobile horizontal and vertical work and display surfaces, such as those shown in Figure 2.21. The Medds’ mobile trolleys, display screens, worktops on castors, and range of linoleum-topped tables with lightweight hollow steel frames (Naylor, 1967) were arranged to create semi-structured temporary settings for various sized groups of children. When a large open area was needed the furniture was simply cleared to one side.

‘Specifically committed zones or bays’ were used for specialist activities such as cooking or science experiments and were designed with special surfaces, facilities and equipment, such as an oven or stove. Some bays were especially equipped for messy work, including working with “water, clay, earth, plants, insects, fish, [and] animals” (Medd & Medd, 1972, p. 9). These settings opened onto verandah spaces, which Sayers (2010) suggests created a seamless relationship between indoor and outdoor learning environments. Metaphorically, this indoor/outdoor connection extended children’s learning experiences beyond school “into the surrounding landscape of farms or suburbs, streets or docks” (Medd & Medd, 1972, p. 10). The design patterns developed by the Medds for Eveline Lowe are particularly significant for this research because they were picked-up by the open-planning movement in Australia in the late 1960s and 70s, the legacy of which is explored in Chapter 8.
Critical to the success of the physical environments developed at Eveline Lowe was the co-evolution of education and school design practices that lay at the heart of the Medds’ research-based and needs-driven approach. The detailed attention the Medds paid to teachers’ pedagogical innovations helped them to accurately assess what was needed in the physical environment to support a new, experiential culture of learning and teaching. The direct access the Medds had to children and teachers who were pursuing experimental practice enabled them to test and refine their design solutions, and the direct influence the Medds’ design prototypes had on teachers’ evolving practice cemented the close fit between pedagogy and design. The learning environments the Medds designed for Eveline Lowe drew upon the vast body of knowledge that they had developed by studying innovative practice in other schools.

2.5 DESIGN EXEMPLARS AS KEYS TO UNDERSTANDING

The learning environments developed by Featherston, Perkins and the Medds for Bialik, Wooranna, Crow Island and Eveline Lowe are vivid and tangible products of design processes, grounded in research, observation and experimentation, that were principally concerned with identifying and supporting the needs of children, new learning relationships, and new teaching practices. In each instance the designers and educators shared a common vision of innovative learning and teaching practice, and for Bialik and Wooranna their collaborations with Featherston occurred at critical periods in the schools’ pedagogical developments. This examination of the process of designing from the inside has revealed the critical role of architects and designers studying daily school routines to identify what was needed to support new education practices. What is less clear is how purposefully designed learning environments function and in particular how their interior design helps to shape the daily routines of collaborative learning cultures.

As contemporary design exemplars Bialik and Wooranna provide opportunities to investigate how purposefully designed learning environments function. In particular how interior design has been used to construct neighbourhood interiors as material expressions of collaborative learning cultures, and what influence those environments have on daily school routines, relationships and learning experiences. They reveal how children and teachers shape and reshape the cultural communication of their neighbourhood interiors via the ways that they use and inhabit them. They also offer insights into how teachers are using physical learning environments to support their evolving pedagogical practice. The next chapter outlines the methodological argument for conducting a systematic investigation of how the interior design of select learning neighbourhoods at Bialik and Wooranna functions in order to uncover what role interior design can play in changing the culture of learning.
3.1 FRAMING A METHODOLOGICAL POSITION

This chapter expands on the aims of the thesis by articulating the methodological position that drove the research. It argues that in order to address questions about what role interior design can play in changing the culture of learning in primary school learning neighbourhoods, it was first necessary to study a small collection of neighbourhood environments that were designed to do just that. This chapter introduces the Prep and Year 6 learning communities at Bialik College and the Prep and Years 5/6 learning communities at Wooranna Park Primary School who participated in the research. It also outlines the research methods used to study these four case neighbourhoods, plus the ethical considerations that informed the research methodology and influenced the choice of research methods. It examines the specific techniques used to generate and analyse the research data, as well as the techniques used to create visual representations of the research findings. Finally this chapter explains the iterative nature of the research speculating that this characteristic may make this research methodology suitable for studying other kinds of interior environments.

Bialik and Wooranna are exemplary places to look for evidence of the role that interior design can play in changing the culture of learning. This is because both school communities employed interior designer Mary Featherston with the express purpose of developing school interiors that would enable children and teachers to foster a new culture of learning. Expressed in its simplest terms the cultural change Bialik and Wooranna sought to make was a shift away from teacher-driven instruction to child-led investigation and discovery. More specifically these schools wanted to provide richer and more varied learning experiences for children than were the norm in conventional classroom environments. They wanted to move away from a singular mode of work where all children were engaged in the same activity at the same time to many modes...
of work. They wanted to create a cultural climate where children were able to use hundreds of expressive languages and multiple intelligences to express their questions and theories about the world around them. They also wanted to create a pedagogical environment where dance and movement were equally valid modes of enquiry as mathematics and scientific experiment.

Bialik and Wooranna also wanted to change the conventional child-teacher relationship. They rejected the image of the child as an empty vessel waiting to be filled with knowledge by the teacher, and instead wished to foster a reciprocal relationship where child and teacher are co-researchers in an ongoing journey of discovery. Both schools also wanted to foster collaborative working relationships between children and their peers. This is because they wanted children to understand learning as a collaborative process and knowledge as a co-construction. This means that whether children were working alone or together with other children, the intent was always to develop a shared body of knowledge about which each child constructs their own understanding. Both schools also realised the potential of the physical environment as a driver in children’s learning investigations through the prompts and opportunities it offers for learning.

Implicit in this research is an expectation that interior design may have a role to play in changing the way that learning and teaching are conducted in primary school learning neighbourhoods. The selected case neighbourhoods comprise multiple learning settings, each a discrete context designed to elicit particular kinds of activities and behaviours from children and teachers in response to specific environmental cues embedded in its design. For example the curved, red vinyl couch in the Wooranna Years 5/6 neighbourhood lounge functions as a social hub. Its bright colour, distinctive form and central location draw children into a zone designed for social interaction and informal learning experiences. The children who participated in the study belonged to large learning communities and worked freely throughout their neighbourhoods, as members of multiple collaborative groups of various sizes. Their teachers worked together in collaborative teams to facilitate the diverse needs of individual children within each neighbourhood community.

Within the documents that constituted the design briefs for the interiors Featherston designed at Bialik and Wooranna are identifiable patterns of activity and behaviour nominated by the school communities as tangible expressions of the new modes of learning and teaching they were trying to foster. By comparing those patterns with the patterns of activity and behaviour exhibited by children and teachers in their neighbourhoods, it was possible to develop understandings of what influence the interior environments had on the schools’ learning cultures. By observing, identifying
and documenting children’s and teachers’ patterns of activity and behaviour this study
aimed to provide evidence of how they used and inhabited their learning neighbourhoods.
If the documented patterns of activity and behaviour matched the patterns nominated
by the school communities as indicators of desirable modes of learning and teaching an
argument could be made in support of the positive influence of interior design in changing
the culture of learning. If the patterns did not match, as happened in this study, questions
about the potential of interior design to support cultural change in primary school
learning neighbourhoods become more complex.

3.1.1 A Designer’s Research Perspective
During this study the Head of Bialik’s ELC, Sonia commented that:
Because [Featherston] is not a teacher… she doesn’t really understand....
There are some parts of her design that maybe if she were a teacher, and
knew what it was like to work with one hundred children in one big space,
[she] might do… a little bit differently. But in other respects, because she’s
not a teacher, she comes with fresh eyes.
The dichotomy articulated here between what a teacher understands and what a
designer sees is central to the methodology of this research. If this study were conducted
by a teacher it is likely that both its research design and the interpretation of evidence
would be different to mine owing to the different ideological perspective and body
of professional and tacit knowledge that a teacher would draw on. The significance
of a designer conducting the research, rather than a teacher, is that the research is about
design. Although it is concerned with studying the ways that children and teachers use
and inhabit their learning neighbourhoods it does so in order to develop understandings
about the influence of interior design on how these environments are used and occupied,
not to develop understandings about how children learn or how teachers teach.

Gillespie (1991) argues that knowledge is a product of the “specific social, institutional,
and ideological contexts” (p. 4) in which it is constructed. In turn he suggests that a
researcher’s particular field of knowledge (for example design or education) will, together
with their own social interests, influence their interpretation of the data and any claims
they make about its practical significance. Therefore, although this research is evidence-
based, interpretation of the evidence is subjective. It relies heavily on my perceptions
as a multi-disciplinary designer conducting the research and on the specific ideological
perspective, ‘professional design knowledge’ (Cross, 2007) and ‘tacit understandings’
(Stake, 2010) that informed my analysis and interpretation of the evidence.
Similarly my design knowledge is a product of a formal design education informed by Bauhaus traditions of experience-based and practice-based learning. The ideological position that design occupies in my imagination is rooted in a conviction that design, whether good or bad, influences people’s lives. This conviction framed the way that I looked at the design of the neighbourhood interiors and the methods I chose to study them. It informed my identification of interior design patterns in the case neighbourhoods and my readings of the interview transcripts. It also shaped my interpretation of the research evidence. My skills as a graphic designer directed the choices I made about how to represent the patterns of children’s and teachers’ movements, the distribution and grouping of their activities throughout the neighbourhood interiors, and their interactions with the objects and artefacts their neighbourhoods contained.

3.1.2 Learning Neighbourhoods, Contexts and Cases For Study
Stake (2010) suggests that some research seeks to understand how things work in general while other research is concerned with understanding how particular things work in specific situations. This study is of the latter kind. It seeks to understand the influence of interior design on human activity and behaviour within the particular environments of primary school learning neighbourhoods. The pedagogical and design innovations achieved by Bialik and Wooranna, detailed in Chapter 2, identify them as exemplars of a broader shift in Australian education towards enquiry-based, hands-on, collaborative learning and the development of physical learning environments to suit. Therefore the learning neighbourhoods at each school can be considered as discrete examples of the larger trend, suitable for study. This approach articulated by Stake uses the context immediate to the ‘thing’ being studied to define the parameters of a case study. That is, each learning neighbourhood is a case, a discrete physical, spatial and cultural context in which to study the influence of interior design.

3.1.3 Making The Invisible Visible
Stake’s (2010) approach is a departure from the more conventional definition of case study research as a specific method of inquiry (Yin, 2009), but ideally suited to observing the function of things that are not transparent or immediately visible. The design of the case neighbourhood interiors and the objects and artefacts they contain imply an ideal function, intended by the designer, which is not necessarily the same as how they are employed by users. This means that although it is possible to ‘read’ the environmental cues, manifest in the material form of the neighbourhood interiors, it is not possible to understand the actual function of individual settings or complete neighbourhoods without studying them as what Sparke (2004b) refers to as ‘lived-in interiors’, in the hands of the children and teachers who use and inhabit them day-to-day.
A useful analogy is a theatre set. Although it is possible to develop some sense of where performers may enter and exit the stage, the scope of their movements, and their relationship to the audience by studying an uninhabited theatre set, it is not possible to understand what functional contribution the set makes to the narrative of the performance or to an audience’s response to the production as a whole. Only when the production is underway and we see the set in relation to the performers, the lighting and sound designs, and the reactions of the audience, is it possible to understand what contribution the set makes to the cultural communication of the production. In the same way the contribution of interior design in shaping learning cultures is only made visible by studying the ways that children and teachers incorporate the neighbourhood interiors and the objects and artefacts contained into their daily school routines. Only then is it possible to develop understandings about how interior design might influence learning cultures and about how children and teachers appropriate design for their own purposes.

3.1.4 Constructing Cultural Change Narratives

Cultural change narratives are the ‘stories’ (Riessman, 2008) told by the Bialik and Wooranna school communities, together with Featherston, about their pedagogical and design reforms. Each is different in its construction and how interior design is positioned within it depending on who is telling the story. In interview for example, Featherston said “It’s not the design I’m interested in. It’s what it makes possible…. I thought that making the design attractive would make the ideas attractive”. Her focus on the pedagogical ideas driving interior design is one facet of a much larger school design narrative about the transformative power of school building design. Like the patterns identifiable in children’s and teachers’ use and inhabitation of their neighbourhoods there were patterns in the themes that emerged within the teachers’ narratives, such as resource management, noise, and the exclusion of unwanted sunlight. These patterns contribute to understandings about the function of interior design because they reveal what the teachers understood about their interiors and their relationship to learning and teaching practices.

The narratives constructed by the Bialik and Wooranna leadership teams identify interior design as a tool used to develop physical environments that would support changing learning and teaching practices, and communicate the school communities’ principles, values and beliefs. Embedded in these narratives are the schools’ identities and the positions they hold as pedagogically innovative communities committed to transforming their physical learning environments to match their pedagogical innovation. These narratives, detailed in Chapter 2, are whole school narratives. The Bialik narrative, for example, centres on the search for an education philosophy suitable for primary and secondary years to complement the influence of Reggio philosophies in the ELC.
Within this narrative the physical environment was designed to support the ELC’s deeply entrenched philosophy. Head of the ELC, Sonia said of the move into their new ELC building “the philosophy was really quite entrenched and I think that was quite important for us too, because if we’d have just moved into our building and we weren’t working with the ideas already, we probably would not have known how to begin”.

At Wooranna too, philosophy came before the physical environment, but the Wooranna narrative links interior design to the school community’s efforts to remove the physical and pedagogical barriers to self-directed and collaborative learning experiences for children. This is a narrative about long conversations about ideas and an action research project to develop a prototype learning environment. The highly experimental nature of this project and the central role children played in the design process form part of the Wooranna narrative. But the Wooranna narrative is complex with many twists and turns. It is also a story about the breakdown of a close working relationship between the school’s pedagogical leaders and lapses back into conventional teaching practices in response to poor external assessment results and faltering pedagogical leadership.

As well as whole school narratives there were neighbourhood narratives collectively constructed by the members of each teaching team. These narratives articulated the identity of individual neighbourhoods and learning communities and located each community within the culture of the school. Interviewing teachers in their team groups was critical to revealing neighbourhood narratives because they were co-constructed by each group and may not have been told had participants been asked to respond to a survey or questionnaire, for example. Some teaching teams developed bridging narratives to rationalise the discrepancy between the designed ‘ideal’ of their neighbourhoods and the reality of the lived-in interiors, and through repetition these narratives had become myths (Barthes, 2000; Forty, 1995).

One narrative constructed by the Wooranna Prep teachers, for example, explained the disparity between the number of children in the Prep neighbourhood and the smaller number of children that the teachers believed the neighbourhood “was designed for” (Student Support Services Officer, Ellen). The myth was that the Prep neighbourhood was noisy because it housed more children than it was designed to accommodate. The ‘too many children’ myth originated with Ellen who was working in the Prep neighbourhood when Featherston developed the plans for the refurbishment. Ellen assumed that the neighbourhood was designed to accommodate the number of children that were in the neighbourhood when the refurbishment plans were developed, which was 36. In fact, the Prep neighbourhood was designed to
accommodate projected enrolments of up to 60 children, 5 more than were in the neighbourhood at the time of this study. The Prep teachers did not know this. Their knowledge of the refurbishment process was what Ellen had told them.

This narrative is an example of a simple misunderstanding that had blossomed into a powerful myth embedded in the learning culture of the Prep neighbourhood. The teachers found support for their belief that the Prep neighbourhood was noisy because it housed more children than it was designed to accommodate, when they experienced a drop in noise levels when one home group was away from the neighbourhood doing physical education (PE). The ‘too many children’ myth together with teachers’ experience of fewer children in the neighbourhood informed their practice of conducting some workshops and target teaching activities elsewhere. Like the myth itself, repetition of the pattern of removing groups of children from the neighbourhood normalized the practice and established it as an embedded cultural pattern.

The significance of cultural and mythic narratives for this research is that teachers constructed them to explain the ways that children and teachers used and inhabited their neighbourhood interiors. Studying these narratives also provided insights into the drivers, other than interior design, that influenced learning and teaching practices. This helped to develop understandings about the role of interior design by highlighting other factors that may challenge or diminish attempts being made to use it to support and promote new learning cultures. The too many children myth, for example, diverted attention away from the possible influence of interior design elements by attributing noise levels to what the teachers believed to be over-population. This example illustrates the complex web of influences that surround cultural change. Within that web the physical and cultural functions of interior design were not necessarily easy to isolate from other influences, including the cultural change narratives and myths.
CHAPTER 3: LOOKING FOR PATTERNS OF CULTURAL CHANGE

3.2 RESEARCH METHODS

3.2.1 Photography - a Legitimate Observation Technique

The case neighbourhoods were designed as holistic environments and in order to understand the interior design of each neighbourhood it was necessary to observe them as total systems. It was important to see how the connections between the learning settings functioned as well as how the settings themselves worked. A contrasting research objective is evident in Moore’s (1986) study, discussed in Chapter 1, that investigated the ways that children used the learning settings in child-care centres. For Moore’s study researchers used conventional observational fieldwork techniques of direct observation and hand written notes to record children’s activities and behaviours on pre-prepared observation sheets. This approach was suitable because Moore’s researchers were observing discrete learning settings or ‘observation cells’ within separate childcare rooms. Unlike the current study Moore’s researchers were not trying to generate data about how all the learning settings in each room functioned to create a total learning environment, rather, they were concerned with generating data about how each setting functioned as a discrete learning environment.

The spatial organisation of the neighbourhoods into multiple interconnected learning settings presented particular challenges for observing them. Employing several researchers to carry out simultaneous direct observations across each neighbourhood would be costly and intrusive, and the data generated would need to be deconstructed and reassembled to create something approximating a neighbourhood-wide view. Most importantly though, identifying patterns within multiple sets of observation notes would have been complicated, particularly as children and teachers would have constantly crossed between the observation jurisdictions of different researchers. To overcome the need to have eyes in multiple places at once, an automated photographic observation system was used. An external consultant was employed by the ARC project to source the equipment and to design and install the observation system according to the research requirements.

Sanoff suggests that “many of the techniques traditionally used by researchers have application potential for designers. Similarly, approaches used by designers equally lend themselves to more systematic use by the researchers” (Sanoff, 1991, p. xv). Photography is used in the practice of all design disciplines as a means of gathering reference material and for documenting and displaying processes and products. According to Sanoff use of photography in design research is informed by the well-established practice of using photographs in ethnography. This is because design research is typically concerned with how people use and interact with design, so it borrows from the ethnographic techniques for studying human culture. The use of photographs in ethnography is similarly influential in the growing use of photographs in social and
cultural studies research (Prosser & Schwartz, 2006; Stanczak, 2007). Barbour suggests that the increasing popularity of photographs and video in social studies and cultural studies research is because they “afford a novel way of researching topics or issues that may be elusive or hard to capture in terms of the capacity of the spoken word” (Barbour, 2008, p. 17). And, as Loizos (2006) explains, researchers treat the videos, films and photographs they generate as research documents, ripe for study and further investigation.

Use of an automated camera system to conduct design research in a school setting is not without precedence as evidenced by this example recounted by Sanoff (1991):

A primary school in New South Wales, Australia, was the location for a study which monitored activities within an open-plan area of the school that was used to enter three adjacent classrooms. The aim of this project was to record photographically the extent of use and the range of activity settings at random times during a week of normal school activities (p. 102).

In the New South Wales case, as in the current study, automated cameras were used for the dual purpose of reducing the obtrusiveness of the observations and to generate synchronous data. In the NSW case two cameras were used to simultaneously generate two sets of slightly offset photographs a process called ‘stereoscopic photography’ (Sanoff, 1991). Each pair of images presents a single view or perspective, but because they are presented side-by-side an illusion of depth is created that overcomes the flattening effect of two-dimensional photographs.

In the current study synchronous photographic data generated by five wall-mounted digital cameras fitted with wide-angle lenses were used to create a holistic view of each learning neighbourhood. This observation technique was chosen because an unobtrusive equipment system could be developed to generate small data sets that could be manipulated by the project researchers using standard QuickTime software on a desktop computer. Alternative observation techniques and equipment including real time video and security cameras were considered, however they were unsuitable. Videotapes would need to be changed during the course of the day, causing disruptions to children and teachers. Security cameras were an attractive alternative to video because the data could be recorded to a central location outside the learning neighbourhood, but the cabling required to link each camera to the recording system would have been obtrusive within the neighbourhood. The large volume of real time data generated by both video and security cameras would be difficult to store and work with. This is because working with real time footage is time consuming and would require the use of a video-editing suite.
Sanoff argues that “erroneous conclusions have been drawn from exclusive use of interviews and questionnaires in assessing human behaviour. Direct observation, on the other hand,” he says “takes its information from the uninterrupted activity of the participants who are usually unaware they are supplying it” (Sanoff, 1991, pp. 77-78). The comparison Sanoff makes between these two research methods implies that direct observation is somehow more accurate or truthful than what people might say or record on survey sheets. However, his comparison denies the influence of the physical presence of the researcher or research equipment on what is being observed and it ignores the selective frames created by researchers and by cameras (Prosser & Schwartz, 2006). The supplementary observation data generated using a hand-held camera, for example, was shaped by my choice of a wide-angle lens, my proximity to the children and teachers I was observing and the decisions I made about what to include and omit from each frame.

### 3.2.2 Hawthorne Effect

“Hawthorne effect” is a phrase “used in textbooks to refer to unexpected influences of non-experimental variables in any experiment in the social or behavioral sciences” (Gillespie, 1991, p. 2). It was coined in reference to a series of experiments conducted between 1924 and 1933 at the Hawthorne Works of the Bell System’s Western Electric Company by Elton Mayo and his colleagues at Harvard Business School, in collaboration with Bell System’s company researchers and supervisors (Galambos & Gallman, 1991, p. vii). The research was designed to study the influence of environmental changes, such as illumination levels and maintaining clean workstations, on workers productivity levels. Unexpectedly, the study found that workers’ attitudes towards their work influenced productivity levels more than alterations in their physical work environment. “Separated from their fellow workers and given special consideration by researchers and supervisors, the workers responded so enthusiastically that the total experimental environment overwhelmed the individual changes in conditions” (Gillespie, 1991, p. 2).

Although the presence of the Hawthorne effect in the case neighbourhoods cannot be discounted there is no reliable way to measure its influence. What is born out in the observation data is that initially children and teachers looked at the wall-mounted cameras and pointed at them, children also pulled faces at them. This behaviour ceased after the second day of observations and the children and teachers made no further demonstrations of attention towards the cameras. An exception to this was the Bialik Year 6 neighbourhood. On three separate occasions after the second day of observations children from different year levels visited the Year 6 homerooms during lunch breaks and looked, pointed and pulled faces at the cameras. Informally children and teachers who participated in the research reported having forgotten about the cameras.
3.2.3 Photographic Observations

A wall-mounted automatic digital camera system and a hand-held digital single lens reflex (SLR) camera were used to generate photographic data in the learning neighbourhoods. The function of the automated system was to generate data that could be used to make visible the patterns of children’s and teachers’ daily routines within their neighbourhood interiors (J. Collier, 2006). More specifically the automated system was designed to generate photographic data that could be used to document three pattern types, each of which would help develop understandings about how particular aspects of interior design functioned in the case neighbourhoods. To develop understandings about how the circulation routes and the spatial organisation of each neighbourhood operated it was necessary to identify and examine the patterns of children’s and teachers’ movements. To develop understandings about how learning settings functioned, both as discrete venues and as parts of an interconnected environment, it was necessary to identify and examine the distribution of groups and individual children and teachers throughout each neighbourhood and their patterns of occupation in each setting. It was also necessary to identify the patterns of children’s and teachers’ interactions with their neighbourhood interiors and the ways that they used and incorporated material objects and artefacts into their daily routines.

Figure 3.1 shows the two-week observation period scheduled for each school that was split between observations made using the automated camera system and observations made using a hand-held camera. During the first week of observations at Bialik College, for example, the automated system was installed in the Prep neighbourhood while I used the hand-held camera to document my observations in the Year 6 neighbourhood. In the second week the automated system was installed in the Year 6 neighbourhood and I used the hand-held camera in the Prep neighbourhood. The same schedule was planned for Wooranna Primary School, however both observation techniques were used concurrently in the Prep neighbourhood during the second week as the hand-held observations scheduled for the first week were delayed because consent to participate in the research had not been received for all the Prep children prior to the first week.
I used the hand-held camera to record daily observations in each learning neighbourhood over the course of one week. Guided by the neighbourhood timetables and in some cases the data already generated by the automated system, I chose a range of observation periods to study a variety of learning activities. In the Wooranna Prep neighbourhood, for example, I observed children during learning agreement time, workshops, target teaching sessions, home group meetings and at lunchtime. Each observation period was between 30 minutes and 90 minutes and the maximum number of visits made in a single day was three.

The data generated was transferred from the camera and stored on an external hard drive. The time and date stamps for each photograph were used to reference them against neighbourhood timetable.
Five wall-mounted automatic digital cameras were installed in each case neighbourhood for one week, with the exception of the Bialik Prep neighbourhood where two cameras were installed in the participating homeroom. The cameras were positioned to provide the greatest possible coverage of each neighbourhood. The specific camera locations are shown on the neighbourhood plans in section 3.4. Wall brackets were fixed according to the chosen camera locations and remained in position for the duration of the observations. A mount was fitted to each camera to hold it in the desired position relative to the wall bracket and a custom-made delivery pin fitted onto a commercial extension pole was used to raise and lower the camera and its mount from floor level as illustrated in Figure 3.2. This was necessary so that the data could be removed from the camera at the end of each day. Consistent registration was achieved for each camera by aligning the locator disk on the camera mount with a corresponding notch in the wall bracket. This ensured that each camera consistently pointed in the desired direction and plane, and at the correct angle. Each camera was separately powered and functioned as a discrete unit so that if one camera malfunctioned the others were unaffected.
Half an hour before school commenced each day I inserted labeled memory cards into their corresponding cameras. At the end of each day I removed the cards to transfer the data to a secure external hard drive and returned the newly emptied cards to the cameras the following day. This sequence was repeated each day throughout the observations. The data generated by all the cameras in each neighbourhood were synchronised by matching the time stamps on the photographs. A simultaneous view of the whole neighbourhood was achieved by combining the frames from each camera with a clock and frame counter in a split screen configuration, as shown in Figure 3.3. Strung together, these frames were used to create a series of time-lapse sequences, one for each day, that were published as a one gigabyte (1GB) QuickTime movies programmed to playback at a rate of 10 frames per second. At this rate, viewed on a 23-inch computer monitor, individual children and teachers could be tracked through the environment. The sequences could also be viewed, frame-by-frame, by advancing or reversing the sequence using the arrows on the computer keyboard. By holding down these keys the sequence could be reviewed at high-speed forwards or in reverse as required.

3.2.4 Semi-Structured Interviews

Together with Dr. Denise Whitehouse, one of the ARC Project’s chief investigators and my principal supervisor, I conducted one semi-structured interview with each of the four teams of teachers whose learning neighbourhoods were the subjects of the photographic observations. We conducted three more semi-structured interviews with the principals of each school and Mary Featherston. Dr. Whitehouse’s role in the interviews was to generate data for the broader ARC Project, while my focus was directed towards the aims of this thesis. The interviews were conducted at the schools in the privacy of a closed office or learning space, with the exception of the interview conducted with Featherston and Wooranna Assistant Principal Louise, which was conducted at Featherston’s studio.

Researchers and participants sat together around a meeting table during the interviews, which each ran for approximately two hours. Digital audio recordings were made of the interviews using a laptop computer and the researchers also took notes. An analogue tape recorder was used to make a second, back-up audio recording after the digital recording software failed during the interview conducted with Year 6 teachers at Bialik College. The interviews were transcribed verbatim and notes were added to indicate responses such as laughter, or particular ways that comments were delivered such as ‘recalled fondly’ or ‘in hurried qualification’. The exception was the Bialik Year 6 interview, an account of which was pieced together from the notes taken by the researchers and conversation paraphrased from memory.
At the start of each interview participants were asked to introduce themselves and to describe their training and teaching experience. Informal conversations with two student teachers at Bialik and Wooranna suggest that the physical learning environment receives little attention in current teacher education programs. The semi-structured interviews provided an opportunity to generate data on this point as half of the teachers who participated in the research had been teaching for less than five years. A distinction is made in this thesis therefore between ‘recent graduates’, with less than five years experience, and more experienced teachers.

The focus of our interviews with teachers was on the ways that they used their physical learning environments to suit their teaching practices. The focus of our interviews with school leadership teams and Featherston was to discuss the collaborative design processes they used. Selected photographs from the observation data were used as catalysts for discussion (Barbour, 2008). Specific questions about the photographs were posed when we were seeking input from the teachers to contextualise or interrogate the data. At other times teachers volunteered information, commenting on how typical or atypical they considered the photograph scenario to be. We asked clarifying questions where necessary and the teachers asked questions of one another and occasionally of us. Floor plans and photographs of furniture served the same catalytic function in the interviews conducted with the school principals and Featherston.

3.2.5 Archival Documents
As documented in the previous chapter, Featherston’s design collaborations with Bialik and Wooranna began with periods of intense discussion and interrogation of each school’s educational philosophy and pedagogical vision. These discussions helped to crystallise the core principles, practices, values and beliefs that drove the design process. This research examined the archival documents that constituted the design briefs and those that documented the design processes in order to understand the intent of each redesign. But more specifically, to understand what the new cultures of learning they were trying to shape would look like, and how they might be manifest in children’s and teachers’ activities and behaviours within the refurbished neighbourhood interiors.

At Wooranna three key archival documents were studied. The first entitled *Wooranna Park La raison d’etre* (Capp, 2005) sets out the interconnected relationship between principles of learning, pedagogical practice, assessment, organisational structures, the physical environment and educational theory. This document clearly articulates the kinds of working relationships children and teachers were intended to have, how their activities would be conducted and the desirable size of working groups for particular activities.
It also details how teachers were to monitor and assess children’s progress and the ratio of time children were expected to spend engaged in self-directed activities compared with guided activities. The second records the *Inside-Out Project* (Featherston, 2006), the action research project that framed the redesign of the Years 5/6 neighbourhood. This document captures children’s expressions of their own needs documented during the collaborative design process. It also explains the detailed investigations Featherston and the children made to understand how those needs could be addressed by the design of the physical environment. The third is the learning documentation for a long-term investigation conducted by Year 2 children at Wooranna called *The Puppet Project*. This document is significant because for Featherston it was proof that the kind of deep learning investigations being conducted by very young children in Reggio preschools was possible in primary school settings in Australia. This document records in great detail the kinds of materials children were using, the sorts of settings they needed to conduct their investigations and the nature of their working relationships.

At Bialik archival material was limited to the *Furniture and Fittings Manual* Featherston produced for the ELC teachers. This manual contains a variety of carefully documented floor plans showing how the modular furniture system she designed could be configured to create a range of different learning settings. The annotations accompanying the floor plans provide clues about what activities children would be doing and the different sized groups they would be working in. Bialik’s very strong commitment to Reggio philosophy and the development of *Cultures of Thinking*, the learning philosophy co-authored with the Project Zero, mean that the literature produced by Reggio and Project Zero researchers also provided valuable information about the learning culture Bialik was trying to create.
3.3 ETHICAL CONSIDERATIONS

3.3.1 Observations

Ethical considerations, peculiar to conducting research with child participants, informed how the observations were conducted. The vulnerability of child participants and the rights of children and teachers to work without interruption influenced the choice of observation techniques, the selection of camera equipment and in particular how the research was explained to would-be participants. The observations were planned in consultation with the individual teaching teams who advised what things they thought children would like to know about the research. Their advice was incorporated into explanatory sessions for children and teachers in each case neighbourhood prior to the observations, including a presentation of photographs taken from the perspective of the wall-mounted cameras so that the children and teachers could see what the cameras would be recording such as the view shown in Figure 3.4.

Following advice from Professor David Clarke, Director of the International Centre for Classroom Research at The University of Melbourne, children also had an opportunity to handle and explore the camera equipment. This prompted questions including, “Will we be able to hear the cameras taking photos?” and “Do the cameras have a flash?” The cameras did not have flashes and despite the children’s best efforts during the observations they reported that they were unable to hear the cameras taking photos. Care was taken to explain the processes of data collection, storage and use. Children and teachers were shown examples of the graphic techniques, shown in Figure 3.5 that would be used to conceal their identities and protect their privacy.

FIGURE 3.4 - Sample Wall-mounted Camera Observation Photograph
Bialik Prep Neighbourhood, Sophie’s Homeroom

FIGURE 3.5 - Sample Human Silhouettes
3.3.2 Consent to Participate

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</tbody>
</table>

* Non-participation due to absence.
** Non-participation because consent forms were not returned.
*** Casual relief teachers appointed after the observations commenced and were therefore considered as non-participants.

FIGURE 3.6 - Participation in the Observation Research

The consent instruments for the photographic observations were designed in alignment with the expressed philosophies of the schools that engaged children in decision-making processes that affect them. Invitations to participate in the research were issued to children, parents and guardians and consent to participate was sought from children as well as from their parents and guardians. The consent forms for Prep children included a section for children to indicate their willingness to participate and a place to sign beside their parent or guardian’s signature. Consent forms were issued to Years 5 and 6 children and separate consent forms were issued to their parents and guardians. Both approaches were effective in obtaining consent, though the forms signed by children and countersigned by their parent or guardian required participants to complete less paperwork and were more efficient for administrative purposes than using two separate forms, making the countersigned form the most suitable for future research.
For the observations to proceed as planned, 100 percent participation was required from children and teachers in each neighbourhood, as the automated system would photograph everyone in each neighbourhood indiscriminately. As the table in Figure 3.6 shows full participation was not achieved in any of the neighbourhoods. This inherent vulnerability in the research design was overcome by making a provision outlined in the consent information for children not wishing to participate in the research to remain in their neighbourhood during the observations with the understanding that their images would be excluded from the data. In the case of the Bialik Prep neighbourhood some parents did not want their children to be photographed under any circumstances. In this case the organisation of the learning neighbourhood was such that the range of the automated system could be limited to the one homeroom that had 100 percent participation. It was still possible to make observations using a hand-held camera in the other two homerooms and the shared plaza space by avoiding the children who had chosen not to participate. Excluding images from the data involved manually positioning an opaque shape to cover the head and face of non-participants in each digital image. This was a time consuming but essential process given the sensitivity of the photographic data.

Controversy surrounding Australian photographer Bill Henson’s use of naked child models in his artwork and their reported procurement through visits he made to schools coincided with this research. Although it was not directly cited as a reason for non-participation in this study the controversy did contribute to the general air of anxiety surrounding photographic images of children. On one occasion a Bialik Prep parent contacted me to explain that his family had no wish to prevent the research and that they were sure the data would be used responsibly by the ARC Project team. However, he was not convinced that the planned data security measure of storing the data on an external hard drive that was not connected to the internet was sufficient to prevent images of his child being accessed by unintended persons. His concern was even more poignant when considered in the context of a digital climate where the majority of Australians, including some Australian children, carry mobile phones capable of taking and uploading photographs to the Internet.

Information sessions for parents and guardians were planned and advertised at both schools, though they failed to attract audiences. Some parents directed questions about the research to the teachers and two parents contacted me directly. It was not possible to draw definite conclusions about why parents and guardians did not attend the information sessions. It may indicate, for example, that they were satisfied with the level of information supplied about the planned research. Equally it could indicate that the after-school sessions were inconvenient for them to attend. The success of the information sessions for
children and teachers suggested that the information was valuable but that for future research it should be communicated to parents and guardians via different means, such as via the consent information documents. For the majority of Wooranna families English was a second language. Including some pictorial content in the consent information documents may have explained more effectively how the research would be conducted and how the data would be used. It may also have alleviated concerns about data security by providing specific illustrations of what was meant by terms such as ‘de-identified data’. As well as the obvious benefits of increasing participation rates the consequent decrease in the number of non-participants who needed to be excluded from the data would have significantly reduced the data processing time.

3.3.3 Interviews

Barbour (2008) recommends careful consideration of the potential distress that may be caused by bringing groups of individuals together in interview and discussion settings. In particular how speaking in front of peers may affect an individual’s willingness to participate. Also how it may affect the nature of an individual’s participation. The planned interview groups comprised the teaching and leadership teams who routinely worked together within the schools. The majority of interview participants were women, whom Reinharz (1992) suggests feel more comfortable participating in group discussions than in individual interviews. It was considered unlikely that participants would experience distress during the interviews, although it was considered highly likely that the data would be influenced by the group dynamics (Barbour, 2008; Drever, 1995). As one aim of the semi-structured interviews was to record the cultural change narratives developed by each group the anticipated influence of group dynamics on the data was desirable.

Together with the consent instruments participants were supplied with sample questions, indicative of the topics that would be discussed, as well as a list of the individuals who had been invited to participate in their group. The majority of teachers chose to participate in the interviews. Details of how many teachers participated compared with how many were invited to participate are detailed in Figure 3.7. The possibility that individuals wishing to participate in the research may not wish to do so within their allocated group was considered prior to conducting the interviews. This was the case for one interview planned with Featherston and the Wooranna principals. It was rescheduled as two separate interviews: the first with Wooranna Principal, Bryan, and the second with Featherston and former Assistant Principal, Louise, who had since taken up the position of principal at a different school. With the exception of Featherston who expressly wished to be identified, the names of the individuals who participated in the research have been altered in the thesis to preserve their anonymity.
3.4 LEARNING NEIGHBOURHOOD CASE PROFILES

The choice of methods used to study the design of the neighbourhood interiors was influenced by the particular understandings that I sought to develop about what role interior design can play in changing the culture of learning in primary school learning neighbourhoods, and by the nature of the learning neighbourhoods themselves. They are physically complex environments and, as is discussed in section 3.8 Research Methods, their spatial organisation and the physical relationship between learning settings, necessitated the use of multiple cameras to make photographic records of the ways that children and teachers used and inhabited them. The location of the cameras in the neighbourhoods and their individual frames of view are illustrated using floor plans, photographs in Figures 3.8 - 3.11, and written descriptions. The teaching teams and cohorts of children are also introduced together with explanations of what learning and teaching looked like in each neighbourhood. The profiles that follow are included to provide evidence for the choice of methods used, and to help orient you, the reader, by providing some key images and descriptions for you to refer to and carry in your mind’s eye as you read this thesis.
3.4.1 Wooranna Park Primary School Prep Learning Neighbourhood

**FIGURE 3.8 - Camera Positions and Views**
Wooranna Prep Neighbourhood
The Wooranna Prep neighbourhood was an unmistakably child-centred environment. The proportions of the learning settings and the scale of the furniture were child-size. There were open spaces for children to move and be active and there were enclosed places they could retreat to like the reading loft. There was also an entry gallery, a lounge, an amphitheatre, a listening post and reading loft, a studio laboratory, a darkroom, and settings for target teaching, small and large-scale construction, communication, problem solving and role-play. Plus a cloakroom and materials store. The ambience of its light filled interior and neutral colour scheme with bold highlights was bright and welcoming.

The photographs in Figure 3.8 show the five different views captured by the wall-mounted cameras. The number on each photo corresponds to location of each camera indicated on the floor plan opposite. C1 shows the problem solving area in front of the settings for small and large-scale construction and role-play. The role-play vehicle is visible in the top right-hand corner. C2 shows the large-scale construction setting and behind it the setting for small-scale construction. The small settings on the left are for role play, and the sliding door in the lower left corner leads into the cloakroom. C3 shows the communications setting on the left and the amphitheatre on the right. The sliding door in the lower right corner leads into the cloakroom. C4 shows the studio laboratory in front of the communications setting on the right. The reading loft is left of centre in front of the amphitheatre and the role-play vehicle is on the far left. C5 shows part of the entry gallery with the role-play vehicle in the lower left corner of the frame. The lounge is on the right in front of the fish tank and the target teaching setting behind. The studio-lab is shown in the top left corner. Together the five cameras provided a near complete view of the Prep neighbourhood.

Prep is the first year of primary school education in Australia and at the time of this study there were 55 children aged five or six working with three teachers and two student support officers in the Wooranna Prep neighbourhood. Children had direct learning relationships with the three Prep teachers, particularly with their home group teacher. They were also encouraged to develop other learning relationships as members of different groups: ‘whole group’ 55 children, three teachers and two aides; ‘home group’ 18 or 19 children and one teacher; ‘workshop group’ 18 or 19 children (some from each home group) and one teacher; and ‘small working groups’ of three to five children. Lunchtime provided opportunities for children’s social interaction while they sat together to eat their lunch brought from home. Parents were encouraged to spend time in the neighbourhood with their children exploring teachers’ documentation of children learning. They also assisted with reading and preparing fruit for morning recess on Friday.
Experienced leading Prep teacher Carmel moved from a school in Queensland, northern Australia, to work with Wooranna’s education philosophy. Kate was a new graduate trained in early childhood education. Natasha was unable to participate in the interview so the details of her previous teaching experience are not known. Kate and Natasha had both been working in the Prep neighbourhood for just over a year, and the team had been working together for nine months. Each teacher was directly responsible for tracking the progress of 18 or 19 children in her home group, and as a team they had shared responsibility for the whole learning community. Two student support officers worked with two children who required additional learning support. One of them, Ellen, was working in the Prep neighbourhood during the interior refurbishment in 2006/2007 and shared her recollections of this process during our interview.

Every morning children met with their home group teacher to discuss their plans for the day and to sign-up for learning activities. Approximately half their time each day was spent working in small groups on negotiated learning activities during learning agreement time. The rest of the time they were engaged in learning workshops, guided reading sessions, literature studies and whole group activities such as rehearsals for the junior school performance. For 90 minutes each week children participated in specialist learning activities including PE, Japanese studies, and ICT skill development. These activities were facilitated by specialist teachers and took place out doors or in the Da Vinci Centre, the school’s community resource centre. During these periods Prep teachers had administrative planning time. After each learning period children returned to their home groups to reflect on their learning with their home group teacher who documented their reflections.

There were four discrete learning investigations underway in the Prep neighbourhood that underpinned most of the children’s activities. Documentation of a long-term investigation around the themes of community and identity was on display in the entry gallery. It included children’s self-portraits and their reflections about what makes them different and what makes them the same. The other three investigations about going shopping, asking questions, and designing a garden, were supported by learning workshops. The immersive, active and reflective components of learning workshops were designed to kick-start children’s thinking by immersing them in a particular concept, theme or issue as the foundation for a learning investigation. Workshops also provided a forum for children to share ideas and to devise and practice investigation strategies. Teachers used workshops to demonstrate skills and present information, including via audiovisual presentations and excursions.
3.4.2 Wooranna Park Primary School Years 5/6 Learning Neighbourhood

A Classroom Workshop  
B Quiet Study  
C Reading Nook  
D Outdoor Lounge  
E Group Discussion  
F Target Teaching  
G Study  
H Multi-media Hub  
I Neighbourhood Lounge  
J Games and Construction  
K Digital Interactive  
L Child-teacher Conference  
M Entry Gallery  
N Audio Studio  
O Movement and Performance Space  
P Snack Table  
Q Studio Lab  
W Jay’s Home Base  
X Rachel’s Home Base  
Y Christine’s Home Base  
Z David’s Home Base

FIGURE 3.9 - Camera Positions and Views  
Wooranna Years 5/6 Neighbourhood
The Wooranna Years 5/6 learning neighbourhood, like the Prep neighbourhood, was a collection of interconnected learning settings organised within a renovated interior. At ground level the original corridor, now the entry gallery, opened onto a large light-filled space on the south side that housed a lounge and learning settings for individual and collaborative study, target teaching, small group discussion, and games and construction. On the north side the entry gallery provided separate access to the studio laboratory and the large movement and performance space with a recording studio inside it. Children’s personal storage cupboards were incorporated into the interior design of the learning neighbourhood to create divisions between learning settings. Upstairs was a second study and an adjoining classroom workshop separated by a sliding glass door. More of the original walls had been retained in the Years 5/6 neighbourhood than in the Prep neighbourhood, which together with the blinds over the clerestory windows, and glare-reducing film on the south windows created a more subdued ambience.

The photographs in Figure 3.9 show the five different views captured by the wall-mounted cameras. The number on each photo corresponds to location of each camera indicated on the floor plan opposite. C1 shows the raised games and construction setting, children’s personal storage cupboards and the lounge. In the background on the right is the multi-media hub in front of the target teaching setting. On the left is a study setting and more personal storage, behind which is a setting for small group discussion. C2 shows the target teaching setting and behind it the multi-media hub on the left and study on the right. The lounge and raised games platform can just be made out at the back. Behind the wall on the left is the entry gallery. C3 shows the studio-lab, which opens onto the entry gallery, as does the movement and performance space shown in C4. C5 shows the classroom workshop and adjoining quiet study upstairs.

Year 6 is the final year of primary school education in Australia and at Wooranna Year 6 children are part of an fully integrated Years 5/6 cohort. At the time of this study there were 110 children aged 11 or 12 working with five teachers and two student support officers in the Years 5/6 neighbourhood. Children had direct learning relationships with the five teachers, particularly with their home group teacher. They were also encouraged to develop other learning relationships as members of different groups including: ‘home group’ 22 children and one teacher; ‘workshop group’ 22 children (some from each home group) and one teacher; and ‘small working groups’ of three to five children. Years 5/6 parents were encouraged to spend time in the neighbourhood exploring teachers’ documentation of children learning on display in the entry gallery.
Experienced leading Years 5/6 teacher Christine and her college Kathy had been working in the Years 5/6 neighbourhood for eight years. Christine, was working in the Years 5/6 neighbourhood during the *Inside-Out Project* and shared her recollections of the design process during our interview. Kathy chose not to participate in the research so the details of her previous teaching experience are not known. Experienced teacher David had been teaching at Wooranna in the Years 5/6 neighbourhood for two years. It was Jay’s first year teaching in the Years 5/6 neighbourhood, but for the previous five years he was Wooranna’s ITC instructor. Rachel was the newest member of the Years 5/6 teaching team and they had all been working together for nine months. Each teacher was directly responsible for tracking the progress of 22 children in his or her home group, and as a team they had shared responsibility for the whole learning community. Three student support officers worked with children who required additional learning support.

Teachers met with their home group for 20 minutes each Monday morning to plan their week and do team building activities including playing games, reading stories, going for a run outside, general housekeeping and doing quizzes. On other days home groups met for less than five minutes. Some teachers marked a roll, although the majority of children signed themselves in when they arrived. Children spent approximately half their time each week working on negotiated learning activities. The rest of the time they were engaged in other activities including learning workshops, literature and wellbeing circles, committee meetings, school play rehearsals and inter school sport. There was also an energy efficient vehicle elective that 10 children were involved in. Years 5/6 children were responsible for mapping their personal timetable, defining their weekly learning goals, and negotiating their learning journey with their home group teacher during one-to-one consultation. Years 5/6 teachers had 60 minutes planning time together, while children were doing Japanese or PE, plus 100 minutes personal planning time per week.

The learning investigation underway in the Years 5/6 neighbourhood focused on four different periods in history, prehistoric, ancient, medieval and modern. Each child was researching one period to create an historical narrative for a computer animation. The learning investigation was supported with four learning workshops that corresponded with the historical time periods, each facilitated by a different teacher in the classroom upstairs. During learning agreement time children continued their history investigation or chose to work on things of special interest referred to as ‘passion projects’ (Capp, 2005). Children were encouraged to self-manage their learning by setting specific and achievable goals each week. At the end of each week children met in their home groups with their home group teacher to reflect on their experiences during the week.
3.4.3 Bialik College Prep Learning Neighbourhood

A  Computing Setting
B  Home Base/ Direct Instruction
C  Small Group Discussion
D  Maths Problem Solving
E  Communication Setting
F  Reading
G  Lounge
H  Mini-studio
I  Withdrawal Space
J  Children’s Personal Storage
K  Plaza Space - Games and Construction
X  Sophie’s Homeroom
Y  Vanessa’s Homeroom
Z  Dawn’s Homeroom

FIGURE 3.10 - Camera Positions and Views
Bialik Prep Neighbourhood
The Bialik Prep learning neighbourhood is located at the upper east end of the two-storey Early Learning Centre (ELC) building and comprises three separate homeroom spaces, each with an adjoining mini studio, and a separate withdrawal space shared with a neighbouring homeroom. All the homerooms also open onto a shared plaza space that is used for games and large-scale construction. The Prep homerooms are on the north side of the building and have large north-facing windows. The walls and ceilings of the classrooms are white and the floors are blonde wood timber, which makes the rooms feel light and bright. Each teacher had an identical suite of Featherston’s child-scale furniture that she used to create a home base and settings for reading and relaxation, small and large-scale construction, computing, communication (writing and drawing), maths problem solving and small group discussions. The plan in Figure 3.10 shows the different arrangements each teacher created to suit her personal preference and teaching style.

The photographs in Figure 3.10 show the two views captured by the wall-mounted cameras installed in Vanessa’s homeroom. The number on each photo corresponds to location of each camera indicated on the floor plan opposite. C1 shows the communication setting in the lower left of the frame. Beside it on the left is the round table used for small group discussions. To the left of that in the extreme left of the frame is the setting for computing and small-scale construction. In the upper left corner is the home base, also used for large-scale construction. To the immediate right of the home base is the setting for maths problem-solving. The doorway close by leads into the withdrawal space shared with Dawn’s home group. In the upper right is the setting for reading and relaxation. The doorway into the mini-studio is in the lower right corner, just out of frame.

C2 shows the home base in the foreground, the setting for computing and small-scale construction upper right, the mini-studio and the doorway opening onto the plaza upper left, and in the centre of the frame is the setting for small group discussion and behind it the communications setting. To the left of the home base is the maths problem-solving setting and just behind it out of shot is the reading and relaxation setting.

At the time of this study there were 73 children aged five or six working with three teachers and six part-time assistants in the Bialik Prep neighbourhood. The Prep teachers estimated that 98% of the children in the Prep cohort had attended three and four-year-old kindergarten in the ELC. Each teacher and one assistant worked with 24 or 25 children in one of the Prep homerooms. Children stayed with the same home group teacher and assistants during Prep and Year 1 and these were their primary direct learning relationships. Children were also encouraged to develop learning relationships with their peers as members of the same home group, and as collaborators in small working groups of two to five children. Lunchtime provided social opportunities while
children sat together to eat their lunch brought from home. Parents assisted with reading and they were encouraged to spend time looking at the learning documentation on display in the plaza space. Children had indirect relationships with the other Prep teachers and sometimes they collaborated with children from the other home groups on joint construction projects or games in the plaza space.

Experienced teacher Dawn had been teaching in the ELC for three years. Before that she was the part-time ELC librarian. Experienced teacher Vanessa had been teaching at Bialik for one year. Before coming to Bialik she taught in the Prep neighbourhood at Wooranna for four years. She was working there during the interior refurbishment and shared her recollections of working with Featherston during our interview. Sophie was a recent graduate and had been working in the ELC for three years. Prior to teaching she ran Bialik’s Out of School Hours Care (OSHC) program. Prep teachers had one 80 minute planning session together, plus 160 minutes of personal planning time each week. Dawn, Sophie and Vanessa were all involved in the *Cultures of Thinking* research project.

Bialik Preps met with their home group teacher each morning to tell some news from home and to discuss their plans for the day before signing-up for learning activities. Children spent the majority of their time each day doing ‘learning labs’, which were negotiated learning sessions similar to Wooranna’s learning agreement time. They chose from a small number of learning activities and recorded which ones they wanted to do on their learning agreement sheet. Prep children also had eight 40 minute Hebrew language and cultural studies sessions, two 40 minute PE sessions, one 40 minute library session and one 40 minute music session each week. As discussed in Chapter 2, each home group was conducting a collaborative investigation exploring different aspects of ‘identity’ including national identity, cultural identity, group identity and individual identity. Their investigation coincided with a long-running tradition where each Prep and Year 1 home group designed a class flag to hang in the plaza space. They used their investigation to research and develop a visual identity for their home group that would appear on their class flag. Children met with their home group teacher throughout the day and especially at the end of the day to reflect on their discoveries.
3.4.4 Bialik College Year 6 Learning Neighbourhood

**FIGURE 3.11 - Camera Positions and Views**
Bialik Year 6 Neighbourhood
CHAPTER 3: LOOKING FOR PATTERNS OF CULTURAL CHANGE

The Bialik Year 6 learning neighbourhood comprised three separate classroom spaces and a wide corridor on the second floor of the main school building. Each classroom had north-facing windows, however the low ceilings, fluorescent strip lighting, grey blue carpet, off-white walls and institutional furniture gave the neighbourhood a uniformly cool ambience. As discussed in Chapter 2, the corridor, which serviced a small storeroom, the Hebrew language teachers office, toilets, a fire hydrant, and stairwell, was appropriated by the teachers as a collaborative learning setting. They furnished it with surplus chairs and tables to create a large collaborative work surface and several smaller surfaces for independent study.

The photographs in Figure 3.11 show the five different views captured by the wall-mounted cameras. The number on each photo corresponds to location of each camera indicated on the floor plan opposite. C1 shows Joel’s homeroom from the doorway. His desk and the whiteboard were at the front of the room facing the children’s desks, which were arranged in a quadrangle. There were two desktop computers at the back of the room, shown on the far left and children’s lockers were just out of frame on the right. C2 shows Judith’s homeroom from the doorway. Behind the table and two desktop computers arranged along the back wall, on the left, was Judith’s desk. The floor space in front of the windows was for whole group discussions and children’s desks were arranged in four ‘collaborative clusters’ in the centre of the room, so that children could see the whiteboard. Children’s lockers were out of frame on the right. C3 shows Aaron’s homeroom from the doorway with children’s desks arranged in a quadrangle facing towards the electronic whiteboard at the front of the room. Aaron’s desk was out of frame in the top right corner and children’s lockers were out of frame on the left. C4 shows the collaborative learning setting from outside Aaron’s homeroom looking back towards Joel’s homeroom. C5 shows the large collaborative work surface on the left just outside Joel’s homeroom.

At the time of this study there were 77 children aged eleven or twelve working with three teachers and two student support officers in the Bialik Year 6 neighbourhood. Year 6 was the final year children spent in the primary school building before moving into a separate building nearby to commence their secondary school education in Year 7. Each teacher worked with 25 or 26 children in one of the Year 6 homerooms and these were their primary learning relationships. Children were also encouraged to develop learning relationships with their whole home group, and in small working groups of three to five children. The Year 6 teachers were also trying to provide children with opportunities to collaborate with their peers from the other Year 6 home groups, which is why they established the collaborative space in the corridor.
Experienced teacher Joel had been teaching at Bialik for 15 years. He and Judith had been teaching together in the Year 6 neighbourhood for eight years. Aaron was a recent graduate who had been teaching with Joel and Judith in the Year 6 neighbourhood for two years. Aaron, Joel and Judith had all been involved in *Cultures of Thinking* study groups. Two part-time aides worked with one child who required additional learning support. Although the Year 6 teachers taught separately they met once a week for 45 minutes to do their planning together.

Bialik Year 6 children met with their home group teacher at the beginning of each day to discuss the day ahead before moving into their first study period. They spent the majority of each day engaged in general studies with their home group teachers. They usually worked independently as a home group and less often in small groups. They also had eight 45 minute Hebrew language and cultural studies sessions, two 45 minute PE sessions, one 135 minute PE session, one 90 minute art session, and one 45 minute music session per week. The children were investigating different aspects of the human body, working in small collaborative groups. Some children were engaged in debating and others were creating and making Power Point presentations, and all the Year 6 cohort were contributing questions to a large neighbourhood project that is discussed in subsequent chapters. At the end of the day they came together as a group for housekeeping and announcements.
3.5 METHODS OF IDENTIFICATION AND ANALYSIS

3.5.1 Visual Analysis

Specific methods were used to analyse and identify patterns within the photographic and interview data, and to create visual representations of the research findings. Visual analysis methods are integral to design studies, practice and research (S. Hall, 2006) and have been adopted and appropriated by designers and design historians from art historians (Bell, 2001; Emmison & Smith, 2002) who use visual analysis methods “to analyse images [and objects] as sources of factual information” (van Leeuwen & Jewitt, 2001, p. 4). For example, an art historian may analyse the technical elements of a work such as the brush strokes in paintings or the tool marks in a sculpture to develop understandings about the way that a work was made. An art historian may also use a thematic visual analysis to study, for example, the use of so called primitive motifs in Western art during the twentieth century. Visual analysis is used to identify patterns in visual material (M. Collier, 2001), and in this study it was used to identifying patterns within the photographic data.

An open-viewing technique, which Stanczak (2007) describes as a process of simply looking at the data without taking notes or identifying patterns, was used to review all the time-lapse sequences for the first time. The purpose of looking at the material openly and without intent is to avoid pre-judging (Stanczak, 2007) in order to see what is there, rather than what you are looking for. Subsequent repeated and systematic viewings were used to identify and record patterns. An observation sheet, shown in Figure 3.12 was used to record a daily narrative of children’s and teachers’ activities and behaviours by logging the visual data against a time scale. Consistent terminology and ordering of information (people, activity, setting), was used to log the data so that patterns were easy to identify and comparisons between different time-lapse sequences could be made easily.
3.5.2 Narrative Themes

The interview transcripts were analysed to identify key issues and themes emerging within the teachers’ stories (Abell & Myers, 2008; Riessman, 2008). The themes emerging from those narratives such as noise, lack of permission to change the physical environment, and conflict in the physical environment between specialist language studies and general studies, were used as devices for making comparisons (Riessman, 2008; Yin 2009) between neighbourhoods and between teaching teams. This should not be confused with formal thematic analysis used in sociology to develop specific codes used to quantify qualitative interview data (Boyatzis, 1998). This research is not interested in quantifying the interview data, neither is it concerned with studying the verbal interactions between teachers, as in conversation analysis (Krzyzanowski, 2008). Rather, it is concerned with how teachers constructed narratives (Riessman, 2008) about their neighbourhoods and their individual and collective teaching practices. Most importantly it is interested in how teachers positioned interior design and the physical environment within those narratives, and in relation to their teaching practices.

3.5.3 Behaviour Mapping

Using a technique Sanoff (1991) calls ‘behaviour mapping’ the observation data was manually plotted onto the relevant floor plans to illustrate the movement of children and teachers within their learning neighbourhoods, as illustrated by Figure 3.13. These graphic representations were used to examine the ways that individual children and teachers moved around their neighbourhoods and the movement trends across a neighbourhood group. Conclusions were drawn from these representations about the functional effectiveness of circulation routes and the spatial organisation of the learning neighbourhoods.

A similar graphic technique was used to map the distribution of children and teachers within their learning neighbourhoods. Coloured dots were manually positioned on the relevant neighbourhood floor plans to correspond with the positions recorded in the time-lapse sequences, as in Figure 3.14. The resulting graphic representations include a time scale to enable cross-referencing with the observation data recording sheets and the time-lapse sequences. Direct comparisons between the neighbourhoods are easily made using both these techniques because the patterns they document are immediately visible. For example, compare Figure 3.13 with Figure 3.15. Both illustrate the pattern of movement of a single child at the same time of day for approximately the same period of time. The number of moves are similar, but the area covered in Figure 3.13, is much larger than in Figure 3.15.
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FIGURE 3.13 - ‘Behaviour Mapping’
- Patterns of Movement
Wooranna Years 5/6 Neighbourhood
Day 2, 9:00 - 12:30

FIGURE 3.14 - ‘Behaviour Mapping’
- Patterns of Distribution
Wooranna Years 5/6 Neighbourhood
Day 2, 12:00

FIGURE 3.15 - Pattern of One Child’s Movement
Bialik Year 6 Neighbourhood, Day 3, 8:53 - 12:50
A technique of visual representation used by Preiser, Rabinowitz and White (1988) in post-occupancy evaluations of Indiana elementary schools is used here to illustrate the patterns of children and teachers’ interactions with their neighbourhood interiors and with the objects and artefacts they contain. Individual photographs taken with the hand-held camera were traced to create simple line illustrations such as the example in Figure 3.16. Details not directly relevant to the pattern being studied, such as colour and background, were omitted to focus attention on what is important to the pattern. This technique was also used to conceal the identity of participants by the omission of key physical features, specifically the eyes. The eye line of each individual is indicated however, because without the eye line it is not possible to see where the subject’s gaze falls and consequently the images do not make sense.

**Figure 3.16 - Simple Line Illustration**

### 3.5.4 Comparison
The archival documents were analysed to detect any direct or indirect reference to how the school communities intended children and teachers might use and operate in the learning neighbourhoods. These references were used to build up a detailed picture of the kinds of activities, behaviours, groupings of people and organisation of time that we could expect to see in the case neighbourhoods as demonstrations of new and desirable ways of learning and teaching. For example, Wooranna’s *La raison d’être* document under the heading of pedagogical practice states “Exploration of and listening to the ‘100 languages of children’ / Multi-literacies developed”. This created an expectation that there would be evidence in the neighbourhoods of children using a wide variety of work modes and a range of different materials and resources in their learning activities. Consequently evidence of children using a wide range of work modes and a variety of different materials and resources in their learning activities was sought within the
photographic data and subsequent illustrations that identified children’s patterns of interaction with their physical environment. If found, this evidence could be used along with other pieces of evidence to build a case for the influence of interior design on children’s activities and behaviour. If no evidence was found, reasons why children were not using the resources available to them in their neighbourhoods according to the designed intent needed to be discovered. Chapter 4 presents a detailed analysis of each of the archival documents to construct a more complete picture of the patterns of activity and behaviour this research expected to observe.

3.6 THE METHODOLOGICAL SIGNIFICANCE OF THIS RESEARCH

This chapter articulates a methodology for conducting interior design research that did not previously exist. This is significant because it pushes beyond a typical examination of the physical function and ambient qualities of interior design to a strategy for studying the influence of interior design on the daily routines of the people who live and work in these spaces. Specifically this study was concerned with discovering the influence of interior design in changing the culture of learning in primary school learning neighbourhoods. Key to this research methodology is the simultaneous generation of data across entire interior environments that are complex in their spatial arrangement.

The methods of data generation, identification, representation, and analysis are presented in this chapter as a linear sequence, but in practice the study was inherently iterative. This iterative quality made the research nimble and highly responsive to the data being generated. For example, the initial open viewings of the time-lapse sequences were made prior to the semi-structured interviews with teachers. Individual frames from the time-lapse sequences and photographs taken with the hand-held camera were used as catalysts for data generation during interviews with the teachers. In turn the data generated during interviews with the teachers informed the subsequent visual analysis of the observation data and identification of patterns. Some of the issues and concerns raised by teachers also informed the questions put to the principals who were interviewed after the interviews with teachers were complete. Finally the archival documents that constituted the design briefs for the school interiors examined at the beginning of the study were re-examined later on to illuminate why the patterns of activity and behaviour nominated by the school communities as indicators of cultural change were not reflected in the observation data.

In this study the research data have been used diagnostically to understand the influence of interior design on learning and teaching activities and behaviours. This methodology may also be useful in planning new school interiors or other environments that have specific cultural agendas. For example, we may wish to know how interior design could
be used to improve the culture of patient care in a hospital radiology department. Like the learning neighbourhoods within a school, the radiology department is a sub-community within the hospital. An understanding of the relationship between the existing culture of care and the interior design of the radiology department may be developed by documenting the interior design patterns, studying the ways that each setting is used and inhabited by medical staff, administrative staff and patients, and documenting the user experience of each group. Then questions about what needs to be done, in an operational sense, to change existing medical practice in order to improve patient care may be used to interrogate the needs of different user groups and to drive decisions about what design patterns are required to shape a physical environment that will support the new culture of care.

The case neighbourhoods selected for this study were purposefully designed to promote and support cultural change because the Bialik and Wooranna school communities wanted children and teachers to develop cultures of collaborative, experience-based learning. This also meant that they wanted children and teachers to act and behave differently. The next chapter examines the documents that constituted the design briefs for each of the interiors Featherston designed and identifies what those new activities and behaviours were. Then it interrogates the patterns of activity and behaviour observed in the case neighbourhoods against the patterns of activity and behaviour that the school communities sought to foster. The relationship between the observed patterns and the patterns desired by the school communities helps illuminate the role of interior design in cultural change.
4.1 INTERROGATING THE PATTERNS IN THE RESEARCH DATA

The methodological approach of this research, as outlined in the previous chapter, was to discover the capacity of interior design to shape new school routines by comparing the patterns of activity and behaviour that were observed in the case neighbourhoods with those nominated by the Bialik and Wooranna school communities as indicators of positive cultural change. This chapter presents detailed analyses of the documents that constituted the design briefs for each learning neighbourhood, which it uses to interrogate children’s and teachers’ patterns of movement, distribution and interaction that were identified in each case neighbourhood. The research findings demonstrate the potential of interior design to positively influence child-centred learning and teaching practices. They also identify interior design as one of a complex web of interdependent cultural influences, which made isolating and defining the role of interior design in changing the culture of learning in primary school learning neighbourhoods more difficult.

4.1.1 Design Briefs and Behavioural Expectations

Although no formal design briefs were developed for the case neighbourhood interiors there are a handful of documents that served that function. The Furniture and Fittings Manual that Featherston developed as a guide to assist teachers with the spatial organisation of their homerooms is one of these documents. The manual details all the furniture and fittings used throughout the ELC building. It includes floor plans with suggested furniture arrangements for both plaza spaces and each room in the Centre including the staffroom and preparation spaces. An indicative layout for the Prep and Year 1 homerooms with inventory lists of special items and furniture is included. Another page documents the homeroom layout for a particular Bialik Prep teacher, here called Zara, and her home group of 23 children. The plan includes 10 small, interconnected learning settings in the main homeroom space, plus a large group...
meeting area that is defined by a 3.6 x 3.6m carpet mat. Three additional settings are indicated in the mini-studio space. The settings are defined by the arrangement of work surfaces and vertical storage units that are the core elements of Featherston’s modular furniture system. One setting also includes a communication top, which is a table top with a magnetic back panel referred to as an ‘up-stand’.

A few lines of typewritten notes in the top left corner of the page outline a learning session and the various activities that children will be doing, which correspond to the settings shown on the floor plan. First children will gather in a group on the carpet mat for maths instruction about the concept ‘equals’ that Zara will conduct with the aide of a set of balancing scales. Followed by ‘stations’ which are 30-40 minute learning activities including word-focused computing, journal writing, painting, working with clay, building bricks, word play with letter dice, and measuring. There is a hand written note that ‘stations’ is Zara’s term. Reference is made to the stations in the learning settings shown on the annotated floor plan. The stations for painting and working with clay, for example, are set-up on freestanding tables in the mini studio, and the station for measuring consists of a set of balancing scales on a standing height table. On the table tops in each setting are learning provocations expressed as written questions on a card, such as “how many bricks are...?” At the end of the session children gather on the mat to share the results of their work. Some children continue to work quietly in the mini-studio and at the communication top.

Embedded in the annotated floor plan and the learning session scenario are the patterns of activity and behaviour that the Bialik Prep neighbourhood was designed to support and promote. For example, the learning session scenario indicates that there are two kinds of groups, the large ‘whole group’ of up to 23 children who will be together on the mat and smaller ‘working groups’ that will be distributed throughout the homeroom including in the mini-studio. The size of the settings and the distribution of stools indicate that small groups may have as few as two and as many as four or five children working together. The patterns of movement indicated by the learning session scenario is that the whole group will move to the mat and then individual children will move to work in each setting before returning to the mat. The brief description of learning materials and provocations, combined with the importance Reggio philosophies place on providing material resources to enable children to use as many different expressive languages as possible, suggest that Bialik Prep children and teachers will have a highly interactive relationship with their physical learning environment.
Wooranna’s *La raison d’etre* document (Capp, 2005), together with various documents relating to the *Inside-Out Project* and the teachers’ documentation of the Year 2 *Puppet Project* learning investigation all suggest what patterns of activity and behaviour were desirable in the Prep and Years 5/6 learning neighbourhoods. The *Puppet Project* details children’s experiments with light and shadow, their exploration of language to create characters and tell a story, and their growing understandings of scale and measurement. It also includes a large number of photographs that show what kinds of tools, materials and equipment they were using and the work that they created. The *Inside-Out Project* documents the research and design processes Featherston and the children used to plan the refurbishment of the Years 5/6 neighbourhood, including the motivations behind specific design decisions. Wooranna’s *La raison d’etre* is particularly significant because it articulates the relationship between principles of learning, pedagogical practice, assessment, organisational structures, the physical environment and education theory.

Featherston produced a ‘scope of groupings’ document that details 10 different groups identified during the *Inside-Out Project* including their size, learning relationships, and associated activities plus a graphic representation:

1. Individual study or relaxation, one child alone.
3. Playing games, two children facing each other.
4. Socialising and relaxation, four children sitting together.
5. Discussion group, five children and one teacher sitting in a circle.
6. Target teaching, one teacher and eleven children sitting in an oval.
7. Active, noisy, wet and messy activities, five children in a loose cluster.
8. Home group, one teacher and 25 children sitting in a rough circle.
9. Workshop sessions, one teacher facing 25 children sitting in rows.
10. AV presentations, 30 children sitting in rows.

These descriptions and groupings outline what this study expected to observe in the Wooranna case neighbourhoods.

Wooranna’s *raison d’etre* also includes references to working in groups. It stresses the importance of mentoring and collaborative learning relationships for the development of skills, knowledge and understanding by children and by teachers. It explicitly describes “target teaching to scaffold learning (group size 1-15), workshops to promote opportunities for LAT (group size 15-25)” and “tracking of children by home teacher (average 24 children)” (Capp, 2005, Organisational Structures). Because the learning settings in the Wooranna Prep and Years 5/6 neighbourhoods were purposefully designed to support the learning activities and groupings outlined here and in the previous
paragraph, it was expected that those associations would be evident in the daily routines of each neighbourhood. For example, it was expected that workshop groups of up to 25 children and one teacher would regularly work in the Years 5/6 classroom workshop and in the Prep amphitheatre. It was anticipated that during learning agreement time (LAT) small groups of two to five children would be working in each of the settings in the Prep neighbourhood and in all the downstairs settings in Years 5/6 neighbourhood. It was also expected that teachers would be moving between settings facilitating children’s self-directed learning investigations and passion projects.

Direct and indirect references in Wooranna’s *La raison d’être* to Betts’ (1992) autonomous learner model are used to articulate a vision of children as autonomous, curious and powerful learners capable of taking responsibility for their own learning including making decisions about where to conduct their investigations and what materials and resources to use. This vision of children together with the statements “children to move from one setting to another throughout the day” and “freedom to move within spaces” (Capp, 2005, Physical Environment) create an expectation that during learning agreement time children would move to whichever setting housed the resources and equipment they needed for their work. The deliberate decision to distribute children’s storage lockers throughout the Years 5/6 neighbourhood documented by the *Inside-Out Project* suggested that Years 5/6 children would move freely to and from their lockers throughout the day. Also a reference to the Reggio concept of “teachers as co-learners with children as researchers” (Capp, 2005, Pedagogical Practice) suggests that teachers will be working alongside children, which by implication means that they will be moving throughout the neighbourhoods supporting children’s endeavours.

The *Puppet Project* documentation shows that teachers sourced a wide variety of objects, artefacts and materials, including African Dolls, Balinese puppets, rulers, scissors, cellophane, cardboard, paper, aluminium foil and wire, as learning provocations for children’s experiments with light and their exploration of silhouettes. This kind of richly resourced investigation modeled, based on Reggio’s *progettazione*, inspired Featherston’s design and selection of paper shelves and artefact drawers, open shelves, mobile trolleys and pin-board wall sections, which were included throughout the Prep and Years 5/6 neighbourhoods. The expectation implied here was that teachers would be involved in continually developing the richness and variety of learning resources available to children, and that they would document and display children’s theories and understandings.

A statement in reference to some settings “enabling flexibility for temporary change” (Capp, 2005, Physical Environment) created an expectation that teachers would arrange the furniture in each setting to suit changing needs. The lists of furniture, equipment,
tools, materials and learning resources for each setting compiled by Years 5/6 children during the Inside-Out Project, together with a reference to “attractive provision of loose items which provoke, attract, stimulate, support and engage children’s minds and bodies” (Capp, 2005, Physical Environment) suggested that children would have a highly interactive relationship with their material environments. This includes selecting tools and materials from transparent storage containers and open shelves as well as rearranging furniture within settings.

The Bialik Year 6 neighbourhood was developed by the Year 6 teachers without professional design assistance. Because the teachers had only recently started to experiment with bringing three separate home groups together as a collaborative learning community, it was expected that children’s and teachers’ activities and behaviours would follow fairly conventional patterns of classroom behaviour. That is that most of the time children would be working at their desks as a class group either receiving instruction or working under the direction of their home group teacher. It was also expected that children would occasionally work in small groups of two or four and that at other times the whole group would be engaged in activities such as discussions. It was expected that children would move into and out of their homerooms as a group and that during learning periods they would remain at their desks unless they were moving to join peers for group work. It was also expected that teachers would occupy reasonably fixed positions either at the whiteboard or at their desk, and that less frequently they would move around the room monitoring children’s progress. It was anticipated that children would interact most with their own desk and locker and less often with the computers in their homeroom. It was also anticipated that teachers’ interactions with the material environment would be limited to organising wall and ceiling displays and occasionally rearranging furniture.

One area of the Bialik Year 6 neighbourhood where it was expected that alternative patterns might be observed was in the corridor space outside the classrooms that the teachers had developed as a collaborative learning space. Bialik’s partnership with the Project Zero research group to develop thinking strategies that would help children to develop skills as independent and critical thinkers (Project Zero, 2007; Ritchhart et al., 2006, April) indicated that perhaps this research would find evidence of children working together in small groups in the collaborative space independent of their home group teacher and home group activities. If children did use the collaborative space in this way it was also possible that they would move freely between their homeroom and the collaborative space and that they would customise the furniture arrangement to suit their specific activities.
4.1.2 Documenting Patterns of Activity and Behaviour

The patterns of activity and behaviour that this research project sought to identify fall loosely into three kinds: patterns of movement, patterns of distribution and patterns of interaction. The patterns of children’s and teachers’ movements throughout their neighbourhoods were traced by plotting the data contained in the time-lapse sequences, generated by the automated photographic observation system, onto the floor plans of each case neighbourhood. The same technique was used to create neighbourhood-wide snapshots of the location of every child and teacher at particular points in time, which revealed the patterns of distribution in each neighbourhood. The time-lapse sequences, the photos taken with the hand-held camera, and visual analysis of the neighbourhood interiors were employed to study how children and teachers used the settings, furniture and loose items in their neighbourhoods. These data were used to build up a picture of children’s and teachers’ interactions with their neighbourhood interiors including how they selected settings, arranged furniture, and created displays.

Graphic tools developed as part of the research project are used in this chapter to illustrate the patterns of movement distribution and interaction identified in each neighbourhood. These graphic representations of the research data make visible patterns that are otherwise invisible because they only exist in the fleeting rhythms of children’s and teachers’ neighbourhood routines. The research findings reveal marked similarities between the intended purpose and function of the modular furniture system Featherston designed for the Bialik ELC and how the Prep teachers used it to create purposeful and engaging learning settings. They also reveal significant differences between the design intent of the Wooranna Years 5/6 neighbourhood, captured in Wooranna’s *La raison d’être*, and the ways that children and teachers habitually used and inhabited them.

4.2 PATTERNS OF MOVEMENT

The patterns of children’s and teachers’ movements trace the formal circulation routes and the informal tracks within each learning neighbourhood. As Thiel (1997) explains, circulation routes are the formal pathways designed to guide people through built environments, whereas tracks are the informal pathways within each learning setting that exemplify what Attfield (2000) describes as user modifications. Tracks are the small and seemingly incidental pathways defined by the routine use of the neighbourhoods by each learning community. Patterns of movement demonstrate the effectiveness of formal and informal circulation routes in regulating the flow of movement because they reveal which were the main thoroughfares and which were the side tributaries. They also show where movement flowed freely and where the bottlenecks and choke points occurred. The patterns of children’s and teachers’ movements reveal the case neighbourhoods as
holistically designed and interconnected environments. They illuminate the relationship between the formal circulation routes and the spatial organisation of the neighbourhood interiors, including deliberate connections between circulation routes and large interior architectural elements, which functioned as navigation beacons.

The descriptions of “clear circulation routes” and “diverse spaces... always available to the children, enabling children to move freely from one setting to another throughout the day” (Capp, 2005, Physical Environment) contained in Wooranna’s *raison d’etre* created particular expectations about what the patterns of movement in the Wooranna Prep and Years 5/6 neighbourhoods would be like. It was expected that the rhythm and flow of those neighbourhoods would be characterised by children’s free and continual movement between learning settings, and that teachers would move throughout each neighbourhood as required to facilitate children’s learning activities. It was also expected that the daily flow of children’s and teachers’ movements in all the case neighbourhoods would be punctuated by tidal surges of movement at key periods at the beginning and end of each day, and at recess and lunchtimes, when whole communities would be on the move.

When the time-lapse photographic observation sequences were plotted onto the neighbourhood floor plans, the patterns expressed indicated that the ways that children and teachers moved within their learning neighbourhoods were influenced by three key factors: formal circulation routes, the location of home group meeting areas and the informal circulation routes associated with them, as well as the location of children’s personal storage.

### 4.2.1 Formal Circulation Routes

Two different structures for circulation routes were evident in the plotted observation data across the case neighbourhoods. The least effective circulation routes had a circular structure as illustrated by the pathways plotted in Figure 4.1. The circular structure resulted in less free flowing movement due to congestion at key crossover points along the route, including at narrow gaps between tables and in front of children’s personal storage lockers. The most effective circulation routes had a tree and branch structure that facilitated free movement throughout the neighbourhood. The tree and branch structure, an example of which is shown in Figure 4.2, has a broad central path wide enough to carry large volumes of traffic, with narrower branches leading off it to deliver smaller numbers of children to individual learning settings.
FIGURE 4.1 - *Circular Circulation Route*
Bialik Year 6 Neighbourhood, Aaron’s Homeroom

FIGURE 4.2 - *Tree and Branch Circulation Route*
Bialik Prep Neighbourhood, Vanessa’s Homeroom

FIGURE 4.3 - *Central Trunk*
Wooranna Years 5/6 Neighbourhood

FIGURE 4.4 - *Two Primary Branches*
Wooranna Prep Neighbourhood
The circulation routes in the Wooranna case neighbourhoods had a tree and branch structure. The wide doorway openings to each neighbourhood and the broad entry galleries inside created a generous reception area in each neighbourhood. In the Years 5/6 neighbourhood the trunk of the formal circulation route, shown in Figure 4.3, carried traffic through into the entry gallery from where the circulation route branched off into the surrounding learning settings. Large numbers of children arriving at the same time were quickly dispersed throughout the neighbourhood. The same was true in the Prep neighbourhood, the difference being that the trunk in the Prep neighbourhood divided into two boughs at the end of the entry gallery, as shown in Figure 4.4. Smaller branches led off each bough into individual learning settings.

Like the Wooranna entry galleries, the plaza space in the Bialik Prep neighbourhood functioned as a reception area. From the plaza, the circulation routes into each Prep homeroom were shaped by the teachers’ spatial organisation and furniture arrangement. Vanessa and Sophie both created tree and branch structures with strong central paths as Sophie’s homeroom illustrated in Figure 4.5 demonstrates. Smaller paths led into each learning setting. Dawn created a tree and branch structure tending towards a circular structure. As Figure 4.6 shows the central path leading in from the plaza divided almost immediately into three boughs, one through the centre of the room and two others encircling the central furniture grouping. The boughs provided access to most of the settings in Dawn’s homeroom, so the branches leading off them were less pronounced than those in Sophie’s room.
Although the central pathway into the Bialik Year 6 neighbourhood echoed the trunk of the tree and branch structure, the circulation routes into each homeroom, shown in Figure 4.7, were circular. Each teachers’ homeroom layout included a central grouping of tables and chairs with children’s personal storage lockers arranged along one wall to the right of the doorways. The circular pathways encircled the furniture arrangement with smaller paths leading into the clusters of tables and chairs. When children accessed their lockers the pathways immediately in front of the lockers became congested, and the width of all the pathways was reduced when children were sitting at their tables. Congestion was greatest at the points indicated in blue in Figure 4.7, where children had to queue to use the smaller paths to get to their seats or access their lockers. These bottlenecks and choke points interrupted the flow of children’s movements and were most apparent when all the children accessed their lockers and whenever they entered or exited the room. This suggests that both the width and the route of circulation paths were important to free movement. Therefore, the flow of movement in the Bialik homerooms might have improved if the circulation routes were wider and therefore able to disperse more people more quickly.

Comparing the circulation route in Dawn’s Prep homeroom in Figure 4.6, which had a tree and branch structure tending towards circular, with the one in Aaron’s Year 6 homeroom Figure 4.1 (and 4.7, left), which had a circular structure, reveals two key differences that may account for why Aaron’s homeroom suffered from congestion and Dawn’s did not. Firstly, Preps’ personal storage was located in the plaza space, which meant that any congestion associated with accessing lockers occurred outside the homerooms. The lockers in Aaron’s homeroom reduced the amount of space available for circulation and when children were accessing their lockers, their bodies blocked or
reduced the capacity of the main circulation path. Secondly the central bough, or path, into Dawn’s homeroom provided an alternative route to the circular pathway, which Aaron’s homeroom did not have. Instead the path at the centre of Aaron’s homeroom was a second, smaller circular path.

Despite the tree and branch structure of the circulation routes in the Wooranna case neighbourhoods both the Prep and Years 5/6 teachers reported problems with congestion in specific locations. In the Prep neighbourhood the cloakroom became congested when large numbers of children tried to access their belongings at the same time. This was because children who entered the cloakroom, represented by the green lines in Figure 4.8, crossed paths with children leaving the cloakroom the same way, represented by the red lines. The Prep teachers alleviated this problem by regulating the number of children entering the cloakroom to avoid the children coming out.

In the Wooranna Years 5/6 neighbourhood congestion problems occurred when children leaving the upstairs classroom workshop and quiet study settings crossed paths on the narrow stairs with children waiting to enter those settings. This problem was exacerbated during workshop periods when the timetable required approximately 36 children to move downstairs to make way for another 36 children moving into the upstairs settings. To manage this traffic flow problem the teachers opened the sliding doors connecting the upstairs settings and directed children to exit via the external staircase, as illustrated by the red lines in Figure 4.9, while children waiting to enter did so via the internal staircase, as illustrated by the green lines. In this instance the traffic flow problem within a tree and branch structure was solved with a complementary circular route that worked because the flow of traffic was all moving in the same direction.
4.2.2 **Home Group Meeting Areas and Informal Circulation Routes**

Informal circulation routes are pathways created by learning communities in addition to the formal circulation routes established as part of the neighbourhood design. The circular pathway created by Wooranna Years 5/6 teachers to reduce congestion is an example of an informal circulation route. Informal circulation routes were identified in each learning neighbourhood emanating from the home group areas. In the Bialik Prep homerooms there were two distinct patterns of movement linked with home group areas, represented here by the pink circle in Vanessa’s homeroom, Figure 4.10. The wide green line shows the passage of the whole group entering the homeroom and assembling in the home group area at the beginning of the day. The narrow red lines show the informal pathways that were visible when the group dispersed into the other learning settings.

![Diagram of home group meeting areas and informal circulation routes](image)

**FIGURE 4.10 - Two Patterns of Movement**
Bialik Prep Neighbourhood, Vanessa’s Homeroom

**FIGURE 4.11 - Movement between Two Points**
Bialik Year 6 Neighbourhood, Judith’s Homeroom

The red lines demonstrate how effective Vanessa’s spatial organisation of her homeroom was in providing children with easy access to each of the settings in their homeroom. They also illustrate the relationship between the formal circulation route that she established to direct the flow of traffic into her homeroom and the informal network of pathways used by children as they move between settings. The heavy concentration of red lines in the centre of the room where the informal circulation paths intersect with the trunk of the formal circulation route reveals that is a critical junction point in the
circulation network. From what was observed in the Year 6 homerooms, it is likely that the width of this junction point makes an important contribution to the effectiveness of the informal pathways. As demonstrated by Aaron’s homeroom, if the junction point in Vanessa’s room had been narrow it probably would have caused congestion.

The distinct patterns of movement associated with home group areas in the Bialik Prep neighbourhood were not evident in the Bialik Year 6 neighbourhood. This is because each Year 6 homeroom functioned as a home group area. The exception was Judith’s homeroom, which included a dedicated home group meeting area in a clear space just in front of the window indicated by the pink circle in Figure 4.11. Here the whole group assembled for activities such as discussing a class text. Interestingly, when the network of red lines in Vanessa’s Prep homeroom, Figure 4.10 is compared with the red lines in Judith’s Year 6 homeroom, the patterns of movement are quite different. This is because the children in Judith’s homeroom were moving between their tables and the meeting area and back again, rather than to lots of different settings as the Prep children were. Hence the patterns of movement in Judith’s homeroom were manifest as coordinated waves between two points rather than as distinct informal circulation routes.

**FIGURE 4.12 - Patterns of Movement Emanating from Home Bases**
Wooranna Years 5/6 Neighbourhood (left), Wooranna Prep Neighbourhood (right)
Distinct patterns of movement associated with home group meeting areas were also observed in the Wooranna neighbourhoods though the informal circulation routes were similar to the formal circulation routes, as demonstrated by Figure 4.12. The patterns of movement plotted on the Wooranna floor plans from the time-lapse photography sequences indicate two reasons for this. First, individual children entered the Wooranna neighbourhoods as they arrived at school rather than entering as a group. This meant that when children assembled in their home group areas they were coming from all over their neighbourhood rather than via a single pathway. Hence there are no wide green lines in Figure 4.12. Second, although the three Wooranna Prep home group areas and five Years 5/6 home group areas were distinct emanation points for children’s movement, the informal pathways were not overt because children rapidly dispersed throughout the neighbourhood. This appears to be due to the large size of the Wooranna neighbourhoods, the many possible settings children could move to, and the strength of the formal circulation routes.

4.2.3 Personal Storage
The time-lapse photography sequences indicate that children’s storage lockers influenced particular patterns of movement. The plotted movements suggest that what kind of storage children had, where in the neighbourhoods it was located, as well as the personal storage routines established by each home group and neighbourhood community all influenced the ways that children moved between their lockers and other settings in their neighbourhood environments.

In the Wooranna Years 5/6 neighbourhood banks of 12 personal storage lockers were distributed throughout the neighbourhood, as highlighted in mauve on the plans in Figure 4.13, to reduce congestion and provide children with unrestricted access to their personal belongings. Each locker was large enough to store a school bag and other loose items. Years 5/6 children’s patterns of movement indicate that there were four peak periods of access: at the beginning and end of each day, and immediately before and after lunch and recess. No significant congestion problems were observed during those periods. There were two pronounced patterns of movement associated with the peak periods: the wide purple lines on the plan in Figure 4.13 show the routes taken by children when they stowed their bags each morning, the narrow magenta lines in Figure 4.14 show the routes children took during lunch and recess periods and at the end of the day.
Each morning small groups of children arrived in the Wooranna Years 5/6 neighbourhood over the course of 20-minutes. After signing in at the entry gallery they moved to their personal storage area to stow their school bags. No congestion was evident owing to a small volume of traffic over an extended period of time. At lunch and recess periods children from across the neighbourhood, or coming in from outside, moved to their personal stage areas to collect food and learning materials for the next learning period. At these times the flow of movement was gradual and spread across the neighbourhood as shown in Figure 4.14. Again no congestion problems were evident, which appears to be because children did not all access their lockers at the same time. At the end of the day children throughout the neighbourhood moved to their personal storage areas to collect their bags. During this period all the children were trying to access their personal storage at the same time and some children had to queue for their turn.

When and how frequently children chose to access their personal storage was somewhat surprising. Fewer children accessed their lockers outside peak periods than anticipated given that one of the design motivations for distributing children’s personal storage lockers throughout the neighbourhood had been to provide children with unrestricted access to their lockers. Instead children collected everything they needed for the coming
learning period and tended not to return to their lockers until a formal recess period. Despite this unexpected finding, the strategy of distributing children’s personal storage in small banks rather than together in one central location appeared to be effective in reducing congestion and eliminating the kinds of pushing and shoving behaviours that the children involved in the design of the neighbourhood wanted to avoid. Children who did access their lockers outside peak periods used the same routes they followed during peak periods, highlighting the effectiveness of the circulation routes.

Bialik Year 6 children’s personal storage was housed in a single bank in each homeroom. Each child had two pigeonhole-style storage lockers, one for a school bag and the other for books and other personal learning materials and resources. Children also left their belongings on the floor in front of their lockers, as Figure 4.15 shows. The peak access periods observed in the Bialik Year 6 homerooms matched those observed in the Wooranna Years 5/6 neighbourhood. The difference was that only one pattern of movement was observed in the Bialik Year 6 neighbourhood, when children accessed their lockers at the beginning and end of each day and immediately before and after lunch and recess periods. This pattern of movement was characterised by queuing and congestion except at the beginning of the day when congestion was less because children arrived in small numbers over a 20-minute period.
Bialik Year 6 teachers encouraged children to collect all the materials and resources they needed at the beginning of each learning period to avoid the disruption caused by accessing their lockers during learning periods. Some tables were fitted with open shelves or storage tubs, as shown in the illustration Figure 4.16, where children stored their personal materials. In Judith’s homeroom children stored their personal materials including pens, pencils, rulers and dictionaries in cardboard storage trays made from the recycled lids of copy paper boxes that the children had decorated and personalised. Judith introduced the cardboard storage trays because she was concerned at how much time children spent retrieving things from their lockers, so she wanted them to have immediate access to everything they needed so that they were ready to learn.

Wooranna Prep children had pigeonhole-style personal storage lockers that were arranged in a U-shaped configuration in the cloakroom, Figures 4.17 and 4.18. There were four periods of peak activity linked with children accessing their personal belongings that were manifest as two distinct patterns of movement. The first illustrated by the wide purple lines in Figure 4.17 describes children’s entry into the neighbourhood in the morning to stow their school bags before moving off to a learning setting of their choice. The second illustrated by the narrower magenta lines in Figure 4.18 describes children’s pathways between their home group areas, the cloakroom and the outdoors immediately...
before and after lunch and recess periods, when they collected and returned lunchboxes, and at the end of the day when they collected their bags ready to go home. The second pattern of movement was influenced by the previously mentioned neighbourhood routine, which the teachers introduced to restrict the number of children accessing the cloakroom at any one time to avoid congestion.

Bialik Prep children’s personal stores were low cupboards, Figure 4.20, arranged in three banks located in the plaza space outside each homeroom. Two children shared each cupboard and when they arrived at school they stowed their bags in the cupboards and placed their lunchboxes and reading folders on top. The Prep teachers introduced this routine to avoid congestion, which they reported sometimes led to pushing and shoving. At lunch and recess times children collected their lunchboxes and returned to their homerooms to eat before putting their lunchboxes back. At the end of the day children moved into the plaza space with their teachers to pack and collect their bags before waiting to be dismissed. The children’s practice of unpacking their bags at the beginning of the day and packing them at the end of the day avoided congestion during the day and reduced the amount of time they spent opening the cupboards and accessing their school bags. It also meant that the pattern of children’s movement between their homeroom and lockers was the same no matter when or why they accessed them.
The patterns of movement identified across the Bialik and Wooranna neighbourhoods led to four key findings. The first is that clearly articulated circulation routes were essential to the effective function of physically complex learning environments, and that a tree and branch structure produced a more efficient and less congested circulation system than a circular structure. The second is that the location of home group meeting areas influenced children’s and teachers’ patterns of movement. This was particularly apparent in the Bialik and Wooranna Prep neighbourhoods where daily routines revolved around children coming together in their home groups to share and reflect on their learning. The third is that the location of children’s personal storage lockers shaped patterns of movement, sometimes in unexpected ways. It was expected, for example, that Wooranna Years 5/6 children, who had purposefully designed access to their lockers, would access their lockers throughout the day. Instead children in all the neighbourhoods accessed their lockers via established routes at peak periods at the beginning and end of each day and immediately before and after lunch and recess periods.

The fourth and most significant finding, in terms of what it reveals about the influence of interior design in shaping new cultures of learning, is that not all of the patterns of movement identified across the case neighbourhoods were as expected. The patterns of movement observed in the Bialik and Wooranna Prep neighbourhoods were expected, however the patterns of movement associated with the home group meeting areas in the Wooranna Prep neighbourhood were more pronounced than anticipated. The patterns of movement in the Bialik Year 6 neighbourhood were largely as expected, although more free flowing movement between the homerooms and the collaborative learning space had been anticipated than was observed. The patterns of movement in the Wooranna Years 5/6 neighbourhood varied the most compared to what was expected. Although the range of children’s and teachers’ movements demonstrated the opportunities provided by the clearly articulated circulation routes for free movement between and within settings, the patterns of movement identified in the Years 5/6 neighbourhood were less free flowing and more regulated by time tabling than expected.

4.3 PATTERNS OF DISTRIBUTION
Patterns of distribution refer to the location of children and teachers across each case neighbourhood, including the number of individuals working in each setting, the variety of group sizes and the proximity of groups to one another. Patterns of distribution provide insights into how the interior environments supported children’s and teachers’ work and their learning and teaching relationships, such as how many children worked together and whether they moved between groups. Patterns of distribution also illustrate how the school routines, implicit in the weekly timetables, played out in the physical environment.
Featherston’s scope of groupings for the Wooranna neighbourhoods includes: two children playing games, small collaborative groups of three to five children relaxing, engaged in group discussion, or working collaboratively in active, noisy and wet and messy activities. Therefore, it was expected that while children at Wooranna would be working in groups of various sizes, most commonly they would be working in small groups. Because of the emphasis in Wooranna’s raison d’etre on developing and supporting the hundred languages of children and their individual learning dispositions, it was also expected that children would be engaged in a wide variety of activities fairly evenly distributed across each neighbourhood and that each learning setting would be almost constantly in use. In the Wooranna Years 5/6 neighbourhood fewer small groups were observed than anticipated and instead there were more children working alone in the company of others. In the Prep neighbourhood children did work in small collaborative groups during learning agreement periods. Large groups of 15-25 children working together with a single teacher were more common than anticipated, particularly in the Years 5/6 neighbourhood. This meant that at times the distribution of children and teachers across both Wooranna neighbourhoods was less even and more locally concentrated than expected.

At Bialik two patterns of distribution were indicated in the room layouts in Featherston’s Furniture and Fittings Manual. The first, one teacher meeting with her home group on the large carpet square. The second, small groups of children (between two and six) working in all the settings in the homeroom. The influence of Reggio philosophies on Bialik’s pedagogical vision also suggested that children would be using a wide range of materials and learning resources as aides for individual learning expression and that their activities would therefore be located according to the purposeful design and resourcing of each setting. The patterns of distribution that were identified by plotting the time-lapse sequences onto the floor plan of Vanessa’s homeroom closely matched the patterns of distribution that were expected. The plotted patterns of distribution identified in the Bialik Year 6 neighbourhood were also consistent with expectations, except that in the corridor space there was little evidence of children working in collaborative groups and more of children working independently in the company of other children who were doing the same.
The primary influence on the patterns of distribution observed in the case neighbourhoods was the learning timetables that teachers used to manage their learning communities and teaching resources. Two overt secondary influences were digital technologies and home group activities. Computers and electronic whiteboards were frequently used by children, especially in the Wooranna Years 5/6 neighbourhood, and directly influenced patterns of distribution. Home group activities accounted for a significant proportion of the large groups of between 15-25 children observed in each of the case neighbourhoods. Again this was a pronounced pattern of distribution across the neighbourhoods.

4.3.1 Timetables and Noise

Weekly timetables were key tools used by teachers to manage the distribution of their learning communities in the case neighbourhoods. The timetables indicate what learning activities were scheduled where and when, but the drivers behind time-tabling decisions were more complicated than simply managing people in space over time. One driver for time-tabling in the Wooranna neighbourhoods was noise, which emerged as a key issue of concern for Prep and Years 5/6 teachers through the interview transcripts. Teachers reported the challenges of managing high noise levels that they attributed to large numbers of children working in open-plan environments that had insufficient quiet spaces for withdrawal. Members of both teaching teams also regularly took groups to facilities elsewhere in the school as a deliberate strategy to reduce the noise levels in their neighbourhood.

Prep and Years 5/6 teachers at Wooranna used their learning timetables to manage noise levels by limiting the number of children working in the settings and zones in their neighbourhoods. For example, in the Prep neighbourhood no more than six children were permitted to work in each learning setting during learning agreement time. This strategy helped ensure that no settings became overcrowded and that all children had enough space to work comfortably. It also resulted in the even distribution patterns that were expected in the Wooranna neighbourhoods during learning agreement periods. Wooranna Years 5/6 teachers programmed workshop sessions concurrently with learning agreement periods so that approximately one third of the learning community was working upstairs (in the classroom workshop and the quiet study) while the remaining two thirds were working downstairs as shown in Figure 4.21.
Wooranna Prep teachers time tabled their three weekly workshop sessions to run concurrently so that outside the workshop sessions the Prep cohort could participate in learning agreement activities together. Each Prep teacher conducted one workshop, three times per week, in her home group meeting area. So children attended three different workshops in three different settings each week. The Prep teachers explained that they had to experiment with the location of the home group meeting areas before settling on the pattern of distribution shown in Figure 4.22. They arrived at this arrangement because it offered some acoustic separation between the meeting areas so that the members of each workshop group did not have to compete with the other workshop groups to be heard. This arrangement also suited home group activities, such as learning reflections, which were also conducted simultaneously at the end of each learning session. The teachers felt it was especially important that children could hear and be heard when they were sharing their ideas with the rest of the group, because this was how their learning experiences were consolidated.
The Wooranna Years 5/6 teachers were especially concerned that the target teaching setting in their neighbourhood, indicated in green in Figure 4.23, was too exposed to noise. Teacher Jay chose the quieter classroom workshop upstairs to conduct his target-teaching sessions. As indicated by the blue dots, he was working with 9 children in a setting which could accommodate 25, which on this occasion was not a problem because a large number of children were not present in the neighbourhood and everyone else could afford to spread out. At other times Jay’s use of the classroom workshop for target teaching meant that an additional 16 children had to work downstairs, which according to the Years 5/6 teachers reports made the difficulties they experienced with noise levels even greater. It is possible therefore that in seeking to solve an issue with noise for one group of children, Jay may inadvertently have created an even larger noise problem for children elsewhere.

Even more concerning Jay adopted the teacher out-the-front position, appropriate to the environmental cues of the classroom workshop, but arguably at odds with the intention of target teaching where a teacher facilitates peer learning and discussion in a small group. In other words, the position adopted by Jay in Figure 4.23 is consistent with
an instructive, rather than a discursive mode of teaching. Just as in a conventional classroom environment the children were predisposed, by the environmental cues of the classroom workshop, to receive information from Jay rather than engaging in dialogue with their peers, mediated by him. This suggests a lack of understanding on Jay’s part of the significance of the type of learning relationship between the individuals during a target teaching session. It also suggests that he was unaware of the influence of the physical environment on children’s learning behaviours and perhaps even on his own teaching practice.

Both of these possibilities were evident in Jay’s response when the Years 5/6 teachers were asked to explain their involvement in the *Inside-Out Project* and the development of Wooranna’s pedagogy. Jay said “Not so much in the pedagogy… I haven’t done much on that. I don’t really understand it, really. So it’s something I’m still sort of grappling with I suppose”. Jay had been a member of staff at Wooranna for 13 years when he was interviewed, initially as an ICT technician then as an ICT instructor, before moving into the Years 5/6 neighbourhood as a general studies teacher, which he had been doing for one year. Considered in light of his long employment at the school Jay’s comments point to the need for explicit and continual professional development about learning and teaching practices including how the design of the physical environment relates to both. The other Years 5/6 teachers’ comments indicated that they had a much better understanding of Wooranna’s pedagogical vision and the purposeful design of their learning neighbourhood. Their deeper understanding of pedagogical practice may be a product of formal training and teaching experience.

Bialik teachers did not report any concerns about noise other than that occasionally Prep children working in the plaza space were noisy and disrupted specialist music or art and technology sessions in the neighbouring rooms. Bialik Year 6 teachers made it a condition for children working in the Year 6 collaborative space to work without disturbing others, otherwise they had to return to work in their homerooms. It is likely that noise was not a concern for the Bialik teachers because each teacher was managing a group of approximately 25 children in a small homeroom setting compared with the teams of Wooranna teachers who were managing 55 Prep and 110 Years 5/6 children in open-plan neighbourhoods four and six times larger respectively. Support staff working with Bialik Year 6 children regularly used the collaborative space, highlighted in pale aqua in Figure 4.24, for withdrawal when the rest of the learning community were working in their homerooms. Each Bialik Prep home group had access to two quiet withdrawal spaces plus the separate plaza space as illustrated by the areas highlighted in pale aqua in and around Vanessa’s homeroom in Figure 4.25.
The time-lapse sequences revealed that Bialik Year 6 teachers spent approximately two thirds of their teaching time standing or sitting at the front of their homerooms and one third moving around their homeroom. Prep teachers spent approximately one third of their teaching time sitting or standing working with children in their home group area and two thirds moving around their homerooms supervising children’s independent learning activities. The marked difference in the arrangement of furniture in Aaron’s Years 6 homeroom, Figure 4.24, compared with Vanessa’s Prep homeroom, Figure 4.25, suggests one possible explanation for the differences in teacher behaviours. In Aaron’s homeroom children’s tables and chairs were arranged facing the instructional zone, highlighted in blue in Figure 4.24. This arrangement gave him little opportunity to be anywhere other than within the instructional zone. It is worth noting that the table facing the children’s tables was mostly used by the children and Aaron’s desk, highlighted in magenta in Figure 4.24, was positioned one side. He said this was part of a conscious effort not to be the teacher at the front of the room. Vanessa, on the other hand decided not to have her own desk and the spatial arrangement she created meant that she was constantly moving between settings to monitor children’s activities.
At Wooranna the pattern of distribution of the teaching teams was more complex. During learning agreement periods, for example, the members of the Years 5/6 team performed specific roles facilitating workshops and quiet study sessions, target teaching, conferencing and roaming supervision. Each role had an associated zone within the neighbourhood, highlighted on the plan in Figure 4.26. These roles are captured in the learning timetable that indicates which teacher was performing each role during any given 90 minute learning agreement period. Two teachers worked upstairs as workshop facilitators (one in the classroom workshop [fawn] and one in the quiet study [green]), while downstairs one teacher was engaged in target teaching (pale aqua), another in consultation (pink) and the fifth as a roving supervisor (lilac) for children pursuing learning agreement activities.

The roles of conference, workshop facilitator and target teacher are all mentioned in Wooranna’s *raison d’être* and the role of roaming supervisor is implied in the descriptions of children’s learning activities. The documentation of children’s involvement in the *Inside-Out Project* includes a child’s statement that sheds light on the structure of the
Years 5/6 time table “we can’t have 75 people downstairs because that’s too much, so then we have two workshop groups upstairs”. This comment is echoed by Years 5/6 teacher Rachel’s explanation that:

*We’ve got to consider the numbers that are on the floor… at any one time… that’s why there’s always some sort of a workshop group, or project group or something else that meets above learning agreement, because we can’t have all the students on the floor at one time."

What is less clear in these documents is the intended relationship between the roles teachers played downstairs, which makes it difficult to know whether the teaching team observed during this study operated as planned. For example, it is unclear whether the three teachers working downstairs were intended to all operate as roaming supervisors (lilac) and occasionally each teacher taking turns either to run a target teaching session (pale aqua) or conduct a child-teacher conference (pink). Or whether one teacher performed each of these roles continuously for a 90 minute period as was observed in the time-lapse sequences.

The difference between these two scenarios may appear semantic, but having three teachers rather than one performing the roaming supervisor role during learning agreement periods may positively influence the number and variety of learning activities available to children. Evidence in support of this theory was found in the time-lapse sequences of the Wooranna Prep neighbourhood and in the Prep timetable. The Wooranna Prep teachers assumed similar roles to their Years 5/6 colleagues, but because the Prep teachers programmed concurrent workshop sessions they were all available to supervise during learning agreement time except for short periods when teachers took turns to work with small groups of children on guided reading in the target teaching setting as indicated in Figure 4.27. The Prep children were engaged in a much wider variety of learning activities during learning agreement periods than the Years 5/6 children. One explanation is that the Prep teachers were able to support and encourage more varied activities as a team of three than one Years 5/6 teacher could working alone.

4.3.2 *Digital Technologies*

The photographic data from the time-lapse sequences plotted onto the neighbourhood plans indicate that where digital technologies were located influenced the distribution patterns of the learning communities. This was most obvious in the Wooranna Years 5/6 neighbourhood where the desktop computers located throughout the neighbourhood were in use almost constantly. The teachers’ comments suggest that this was typical and that children were probably using the computers to conduct online research for their ancient civilisations history investigation. The large number of desktop computers in the
Wooranna Years 5/6 neighbourhood may account for why their influence on patterns of distribution was so pronounced. Had children been using mobile devices for example, the hot spots that showed up around the desktop computers may have been dispersed in other ways across the neighbourhood depending on where children chose to work.

The desktop computers in the Wooranna Prep neighbourhood were used less often and for shorter periods of time. Wooranna Prep and Years 5/6 teachers had personal laptop computers that they used for administration and learning documentation. The Prep children used their computers for playing maths and language games and for communication activities such as letter writing. There were many other activities for Prep children to choose from, which may account for the patterns of distribution associated with computers being less pronounced in the Prep neighbourhood. In other words computers were no more heavily used than the resources in other settings.

Bialik Prep children used the two desktop computers in their homerooms during negotiated learning periods for maths and language games. Like the Wooranna Prep neighbourhood, the computers were used most of the time, but so were all the other resources in the Bialik Prep homerooms. Bialik Prep teachers also used the computers for short periods of time during non-teaching periods.

Children in the Bialik Year 6 neighbourhood used the two desktop computers in each homeroom for word processing and creating digital presentations during free study periods. They also used computers during time-tabled language and humanities sessions in the neighbouring computer lab. There were long periods of time during general studies and specialist language sessions where the computers in the Year 6 homerooms were not used because children were participating in whole group discussions or direct instruction. At other times children from other year levels came in to use them, which meant that there was no obvious distribution pattern associated with the desktop computers. In fact they were used less frequently than children’s desks and chairs.

Patterns of distribution in the Bialik neighbourhoods were more significantly influenced by the presence and location of e-whiteboards in Vanessa’s Prep homeroom and Aaron’s Year 6 homeroom. Bialik Prep teacher Vanessa regularly used the e-whiteboard in her homeroom as a tool for group discussions, as illustrated in Figure 4.28. Compared to Sophie and Dawn’s home groups, which did not have an e-whiteboard, children in Vanessa’s home group spent more time in their home group area engaged in group discussions. This appeared to be because of the digital resources Vanessa was able to present via the e-whiteboard and the capacity to record the writing that children did on the e-whiteboard. Bialik Year 6 teacher Aaron also regularly used his e-whiteboard as a
teaching tool as shown in Figure 4.29. Children in Aaron’s home group used it to make presentations to the group. Year 6 teachers Judith and Joel used their conventional whiteboards as frequently as Aaron used his e-whiteboard, but children in Judith’s and Joel’s home groups used their whiteboards less than children in Aaron’s home group.

4.3.3 Home Group Activities

It was expected that children in the Wooranna Prep and Years 5/6 neighbourhoods would be working in small groups distributed throughout their neighbourhoods except when they were participating in workshop groups of 15-25 children working with one teacher. Yet as the pattern of distribution of children and teachers in the plans in Figure 4.30 illustrates, teachers met with their home groups each morning. They regularly met as home groups at other times during the day also. The learning timetables indicate that these were scheduled home group activities. Wooranna’s raison d’etre states that each “home teacher” is responsible for tracking an average of 24 children via “weekly individual or small group meeting[s] with [their] home teacher (conference) to discuss learning and personal welfare” (Capp, 2005, Organisational Structures). This meant that the home group activities observed in the Wooranna neighbourhoods were unexpected. Curiously, the raison d’etre also mentions “provision of home group meeting areas” (Capp, 2005, Physical Environment). The key to this apparent philosophical and spatial contradiction lies in the history of the refurbishment of the Years 5/6 neighbourhood, otherwise known as the 5/6 Unit.
Assistant Principal Louise, who had been leading teacher in the 5/6 Unit prior to and during the *Inside-Out Project* explained that:

for the first four or five years in the Unit, the home teacher never met as a group with their home group. That was the philosophy... [the children] had workshop groups, they had project groups, they had all these groups, but the relationship between the home teacher and the child was a relationship in terms of tracking where they were going and what they were doing.... In the first year I had fifteen children that I was the home group teacher for.... So I never met with that group of fifteen children, it was always a relationship of meeting them in small groups, of one-on-one, on tracking and knowing what their big project was. So technically, in essence that fifteen wasn’t a group, it was a relationship with me.... And slowly but surely as I moved back from the Unit, the home group teacher wanting to grab back that group and wanting to meet with that group, wanting to do literature with that group and wanting to have more control of that group.

Louise’s comments are a reminder of just how powerful the conventional school relationship between one teacher and 25 children is.

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**FIGURE 4.30 - Wooranna Home Group Activities**

Years 5/6 Neighbourhood, Day 2, 9.03am (left), Prep Neighbourhood, Day 1, 9.15am (right)
For this study Louise’s comments are significant because they suggest a key driver for the patterns of distribution observed in the Wooranna neighbourhoods. Particularly in the Years 5/6 neighbourhood, the extended periods of time teachers spent with their home groups indicate the persistence of conventional pedagogical practices. This raises questions about the provision of home group meeting areas also. Although there were five spaces in the Years 5/6 neighbourhood large enough for a home group to meet two of them, the steps up to the games and construction setting and the movement and performance space, illustrated in Figure 4.30, were suitable for informal pastoral care activities but not for 50 minute home group study periods. A critical line of enquiry pursued later in this thesis is the extent to which the home group study activities shaped children’s cultural practices in those spaces and influenced how they used those settings at other times.

In the Wooranna Prep neighbourhood the patterns of distribution associated with home group activities shown in Figure 4.30 were equally (if not more) pronounced than those in the Years 5/6 neighbourhood. In the Prep neighbourhood the frequent but brief home group meetings fell into three categories, pastoral care activities, learning reflection, and home group studies. Pastoral care activities were conducted at the beginning and end of each day. The Prep teachers explained that these meetings were important for touching base with children and establishing expectations for the day’s activities. Learning reflection was conducted at the end of each learning period, throughout the day, when children shared their understandings and theories about what they had just learned. Prep home group studies were short periods of direct instruction at the beginning of negotiated learning periods, when specific skills or aspects of the curriculum were taught within the framework of the current learning investigations.

Because the architectural plans for the Bialik Prep and Year 6 neighbourhoods were organised around three homerooms it was expected that children would work in their home groupings most of the time. In the Bialik Prep neighbourhood children did come together in their home groups for discussions and periods of direct instruction, including specialist language sessions. However, approximately two thirds of their time was spent working in small groups of two to five children in their homerooms and in the plaza space. On one occasion when the weather was not suitable for outdoor play, all three home groups were together in the plaza space building with blocks and playing games. In the Bialik Year 6 neighbourhood children spent most of their time working in their homerooms usually as a whole group, but sometimes in groups of three or four children. When children were working in small groups one or two groups moved out into the shared collaborative space in the corridor. Occasionally children from more than one
home group worked together in the collaborative space, but usually all the children working in the corridor were from the same home group.

The patterns of distribution identified across the Bialik and Wooranna case neighborhoods led to three key findings. The first is that the patterns of distribution across all the neighbourhoods were the direct result of teachers’ use of their timetables to manage who was where within each neighbourhood. Surprisingly many of the timetabling decisions at Wooranna were made in an attempt to manage noise levels. The second is that digital technologies influenced patterns of distribution, but this was most pronounced in the Wooranna Years 5/6 neighbourhood where all of the desktop computers were in use during learning agreement time. The third is that routine home group meetings and home group study periods produced a pronounced pattern of distribution across all the case neighbourhoods.

Two of these findings, the first and the third, suggest that the design of the physical learning environment is less powerful in determining how children and teachers will organise themselves within their learning environments than well established school routines. The learning time tables and home group meeting areas were the most significant factor determining where children and teachers would be at any given time, which was surprising given the purposeful design of the learning settings in the Wooranna neighbourhoods. One exception, highlighted by the second finding, was the almost magnetic effect of digital technologies, especially desktop computers in the Wooranna Years 5/6 neighbourhood, which were used by children almost constantly. None of these findings diminish the importance of purposefully designed learning environments, but they do raise questions about how established school routines could be modified to take better advantage of what new learning environments have to offer.

4.4 PATTERNS OF INTERACTION

Patterns of interaction describe children’s and teachers’ interactions and engagement with the neighbourhood interiors. They are small-scale patterns that reveal the function of each interior setting as a venue for learning experience. They reveal the ways that children and teachers incorporated objects, artefacts, places and spaces into their daily school routines. They also illuminate how teachers used and manipulated their physical environments to promote desirable learning activities, behaviours and relationships.

It was expected that in each case neighbourhood children would have a highly interactive relationship with their interior environments that would be evident in their use of the tools, materials, technologies and resources peculiar to each purposefully designed
learning setting. It was also expected that teachers would play an active role in managing and maintaining material resources as well as creating and recreating engaging displays of objects, artefacts and children’s work. The time-lapse sequences indicate that children in both Prep neighbourhoods had highly interactive relationships with their interior environments, whereas Wooranna Years 5/6 children and Bialik Year 6 children interacted less than expected with their interior environments. The interview transcripts and visual analyses of the case neighbourhoods indicate that Prep teachers were more engaged in shaping their neighbourhood interiors than their Years 5/6 and Year 6 colleagues.

Differences between the patterns of interaction observed across the four case neighbourhoods point to two key influences that shaped children’s and teachers’ interactions with their neighbourhood interiors. The first was how richly resourced with tools, materials, resources and technologies the neighbourhoods were, and whether or not children had access to personal learning materials. The second was how teachers perceived their role and responsibility in managing and maintaining their physical environment and how confident they were in doing so.

4.4.1 Rich and Engaging Environments
Patterns of interaction were most pronounced in the two Prep neighbourhoods. Prep children took cues for their learning activities from the materials and resources available to them in each setting, such as the writing and drawing materials shown in Figure 4.31. They also used each setting and the furniture, tools, materials, technologies and resources it contained according to the designed purpose. During the interviews the Prep teachers indicated that they regularly invested time and energy discussing, planning, creating and maintaining engaging and stimulating settings and environments. The small sign in Figure 4.32, which reads “Represent a page from your food diary”, is an example of the kind of set dressing that teachers did to provoke learning experiences. They used objects, artefacts, tools and materials to suggest creative possibilities. For example, in the setting pictured in Figure 4.32 the tools and materials available for children to use included clay, pencils, paper, paints and brushes. By carefully selecting items to peak children’s interest the teachers created three-dimensional advertisements for the different kinds of activities available in each setting. Both Prep teaching teams devised a menu of learning activities for children to choose from that corresponded to each learning setting, and children’s awareness of what resources were available to them developed when they chose which activities they wanted to do during negotiated learning periods.
Despite the design intent of the Wooranna Prep and Years 5/6 neighbourhoods to stimulate children’s interactions with their physical environments, in the Years 5/6 neighbourhood children’s patterns of interaction were less pronounced than those of the Prep children. The time-lapse sequences show that the Years 5/6 children freely rearranged furniture and moved it between learning settings, but unlike their Prep counterparts, they appeared to choose where to work according to where they felt most comfortable rather than what resources were available in particular settings. This was indicated by their infrequent use of the shared tools, materials and resources in their neighbourhood and their frequent use of the personal resources they carried with them in zip-up compendiums. The exception to this was their extensive use of the desktop computers in all the settings throughout their neighbourhood.

The illustrations in Figure 4.33 show Years 5/6 children using desktop computers in three different settings: the studio-lab, the media hub and the quiet study downstairs. The computers in the studio-lab were intended to support children’s core activities, such as art investigations and science experiments. Whereas in venues, such as the media hub, the primary purpose of the setting was to facilitate computing activities. Interestingly the time-lapse sequences and the plotted data showed no difference between the ways that Years 5/6 children used the computers in each setting. In the studio-lab, for example, children used the computers for word processing activities that were not connected to any other activities in the studio-lab - they were simply working in the studio-lab to use the computers. As mentioned the Years 5/6 teachers suggested that children were using the computers to conduct online research for a particular investigation. Nonetheless it raises questions about the relationship between children’s learning activities and the purpose of settings that they were working in, which are pursued later on.
Years 5/6 children were engaged in reading and writing activities throughout their neighbourhood. They rearranged the furniture and spread out their compendiums to create study zones even in settings designed for other purposes, such as the games and construction setting and the movement and performance space. The photo on the left in Figure 4.34 shows a discarded chess set that was put on the floor so that the games table could be used as a writing surface. The photo on the right shows children studying in the movement and performance space. These observations are troubling not because children used the settings and furniture for activities other than their designed purpose, but because of the high prevalence of reading and writing activities that took place in every setting. This pattern of activity and behaviour appeared to discourage other children from pursuing activities other than reading and writing.

One episode captured in the time-lapse sequences showed three children, one armed with a portable stereo, enter the movement and performance space where several other children were engaged in writing activities. Shortly after they entered the space the three children left again, still carrying the stereo. Although the photographic evidence is not
conclusive, it seems likely that the three children intended to use the stereo in the movement and performance space, but upon seeing their peers engaged in quiet study they abandoned their plans. This scenario is particularly pertinent when considered in light of one child’s comment about the movement and performance space during the Inside-Out Project, “At that present time the drama room [movement and performance space] was more like a writing room which isn’t its purpose”. This reveals that writing in this space was an historical practice, which persisted despite the redesign and refurbishment of the Years 5/6 neighbourhood. In light of the child’s comment, the research observations suggests that more attention needs to be paid to developing new learning practices that promote a variety of activities and exploit the potential of the new interiors to support alternative modes of learning.

Compared with the Wooranna Prep neighbourhood the Years 5/6 neighbourhood was less richly resourced with objects, artefacts and documentation of children’s learning investigations. In the Years 5/6 neighbourhood some displays of children’s work were out of date, and a comparatively small number and variety of tools and resource materials were presented in ways likely to stimulate children’s engagement with their learning environment. The Years 5/6 teachers’ comments indicate that they were less confident about creating and maintaining a provocative learning environment than their Prep colleagues. Their comments characterise the purposeful design of their neighbourhood as supportive of their teaching practice, but they also reveal tension over the design of the learning settings, which teachers found prescriptive as well as supportive. In light of Louise’s comments about the teachers’ need for control it is possible that their concerns were because the learning settings were not suitable for the more conventional modes of direct instruction they had returned to.
Bialik Year 6 children’s patterns of interaction with their interior environments centred on managing their personal learning materials and making small-scale modifications to furniture arrangements in their homerooms and in the shared collaborative space. Figure 4.35 shows a temporary reading nook that this boy created in his homeroom by nestling two ‘fat mats’ into a small space on the floor between two tables. This was a common practice in Joel’s homeroom where children used fat mats to create temporary reading nooks in the corners of the room and in a small space beside the door. Joel’s home group also rearranged their classroom furniture for specific activities, such as a debate when they arranged six chairs at the front of the room for the two debating teams and the rest of the furniture to accommodate the audience. In Judith’s homeroom children created a permanent reading nook lined with cushions behind a low bookshelf in a corner of their room. They occasionally used the cushions to sit on during class discussions in their group meeting area. Aaron’s homeroom did not have any mats or cushions, but on one occasion the tables and chairs were pushed back to create a space on the floor at the front of the room for the whole group.

The Bialik Year 6 teachers’ engagement with the physical environment was limited to creating topical visual displays of children’s work that reflected their current learning investigations. The papier-mâché skeletons in Figure 4.36 are an example of some of the work children in Aaron’s home group were doing as part of an investigation of the human body. The posters on the wall behind the skeletons included several on internal organs. In Judith’s homeroom there were x-ray films hung from string lines that were dismantled just prior to the observations for this study. Judith and Joel created displays of children’s work and learning resources, such as vocabulary lists, whereas Aaron created a digital gallery of children’s work. Other aspects of the physical environment were fairly static, with only small or short term alterations to the furniture arrangement. There were limited options for storing and displaying tools, materials, objects or artefacts, which may explain why these things were largely absent from the Year 6 neighbourhood.

4.4.2 Creators, Curators and Custodians
The four teaching teams each had a different perception of their role in managing and maintaining the physical learning environment. Comparison of the time-lapse sequences with teachers’ comments suggests that teachers’ perception of their role in relation to the physical environment directly influenced their patterns of interaction with it, and indirectly influenced children’s patterns of interaction with it. Children who demonstrated highly interactive relationships with their learning environment were working with teaching teams that were confident in managing their physical environments. These teachers’ comments indicate that they saw themselves as either
creators or curators of those environments. In neighbourhoods where teaching teams were tentative or reluctant to shape their interiors, children relied more on their personal learning resources and less on the resources available to them in each learning setting. These teachers’ comments indicate that they considered themselves custodians of their neighbourhood environments, unable to make changes or lacking the skills to do so. The correspondence identified here between teachers’ perception of their role, their patterns of interaction with their interiors, and those of the children may be explained by Pointon and Kershner’s (2000) suggestion that children repeat the environmental management strategies of their teachers.

Bialik Prep teachers’ comments indicate that they felt empowered by the modular furniture system that Featherston designed for the ELC because it enabled them to create and shape their spaces according to their personal teaching styles and the needs of the children in their home group. While each Prep teacher was able to make autonomous decisions about the spatial organisation and furniture arrangement in her homeroom, the team reported that they regularly discussed their physical environment. They talked about how they were using the different settings in their rooms and helped each other to plan, arrange furniture and make adjustments when they were needed. They perceived that this informal, peer-led professional development was essential to their effective use of the physical environment in their teaching practice. In particular, they said it enabled them to negotiate effectively with specialist language teachers who ran a much more formal program with different spatial requirements in the same physical environment.

Wooranna Prep teachers’ comments indicate that they were enthusiastic curators of their neighbourhood environments. They described the challenges of resourcing and managing such a complex environment, but perceived that it was their processes that needed improvement, not that there was any problem with the design of their neighbourhood interiors. Despite the concerns they raised about keeping paper shelves fully stocked and iPods charged, each of the learning settings in their neighbourhood was richly resourced with engaging learning provocations. The teachers also voiced concerns that they were not permitted to use the wall space to display children’s work. These comments indicate that they felt constrained by the rules of their neighbourhood, but they also indicate a willingness to bend the rules and experiment to find alternative solutions. This was born out by the photographic evidence, which showed that Wooranna Prep teachers made alterations to the physical environment, such as building a makeshift darkroom, when they felt the existing set-up was not supporting children’s learning activities properly.
Like the Bialik and Wooranna Prep teachers the Bialik Year 6 teachers’ comments characterise them as enthusiastic creators of their neighbourhood environment. They successfully created a neighbourhood environment for their learning community by transforming the corridor outside their homerooms to link them together. The changes they made demonstrate that they were confident and willing to experiment. However, although they successfully redefined the corridor as a learning space, they only had tables and chairs to work with and so they were not able to introduce additional resources, such as painting materials and equipment, that were necessary to create the purposeful and engaging collaborative settings that they had imagined.

Wooranna Years 5/6 teachers’ comments indicate that they considered themselves as custodians of their physical environment and they perceived that they were not permitted to modify or change anything in their neighbourhood. Unlike their Prep colleagues who were creative within the limits of what they understood as ‘the rules’, the Years 5/6 teachers’ comments indicate that they felt defeated in their efforts to shape their learning environment and had stopped trying. In particular they expressed concern that they did not have the skills to create meaningful displays of learning documentation. These concerns were reflected in the out-of-date displays in the entry gallery and the sparse displays elsewhere in the neighbourhood. The Years 5/6 teachers also talked about the challenges they encountered in maintaining the designed intent of the environment and their concern that they communicated the same mind-set to children through instructions like “Don’t do that, better not touch that.”

The patterns of interaction identified across the Bialik and Wooranna case neighbourhoods led to two key findings. The first is that children’s patterns of interaction with their material environments directly corresponded with how richly resourced those environments were. Interestingly the two Prep neighbourhoods were both well stocked with learning materials, tools, resources. They also included engaging learning provocations. Whereas the Bialik Year 6 neighbourhood and the Wooranna Years 5/6 neighbourhood were comparatively less well resourced. These observations appear to suggest a direct relationship between children’s age and their engagement with their material environments, however, the second key finding indicates that this relationship was less significant than it appears. The second finding is that there was a direct relationship between children’s level of interaction with their material environments and their teachers’ levels of confidence in managing and maintaining their neighbourhood interiors.
The interrelationship between these two findings suggests that greater attention needs to be paid to supporting teachers to develop the skills and strategies to effectively stock and manage richly resourced learning environments. It also suggests that more work needs to be done by at Wooranna to support Years 5/6 teachers to develop a better understanding of the pedagogical potential of their material environments. The evidence of the Bialik and Wooranna Prep teaching teams is that a detailed understanding of how to use different learning materials assists teachers to create opportunities for children to use a wide variety of expressive languages in line with the pedagogical vision outlined in Wooranna’s raison d’etre.

4.5 QUESTIONING THE PATTERNS

As well as providing insights into the influence of interior design in shaping school routines, the patterns of activity and behaviour examined in this chapter prompted further questions about why the Bialik and Wooranna learning neighbourhoods operated the way they did. In particular why many of the research findings did not match the research expectations, especially in connection with the Wooranna Years 5/6 neighbourhood. In this chapter the influence of interior design in directing the activities and behaviours of the children and teachers working in the case neighbourhoods has been examined in relative isolation. In reality the influence of the physical environment is part of a complex and interdependent network of influences that mould a school’s culture of learning. This suggests that only by broadening the focus of this investigation to look at the influence of interior design in conjunction with some of the other influences will it be possible to develop a better understanding of the potential role that interior design might play in changing the culture of learning in primary school learning neighbourhoods.

The overt influence of home group activities on the patterns of distribution identified when the time-lapse sequences were plotted on the neighbourhood floor plans indicate that further exploration of the organisational structures and strategies at each school is needed. As mentioned Wooranna’s raison d’etre clearly articulates the decision of the pedagogical leadership team to dispense with home groups, yet both the photographic data and the transcripts of the interviews with teachers reveal that home groups were an important organisational structure in each case neighbourhood. This prompts questions about what motivated teachers to pursue home groups when the school’s leadership team had explicitly rejected them. As subsequent chapters will show, the subject of home groups was a particularly vexed issue at Wooranna that was driven by concerns as diverse as teachers’ desire for control and the pressures of external assessment régimes.
The four case neighbourhoods provide examples of three different kinds of learning environments, that together prompt questions about the relationship between interior designers and the users who inhabit designed environments. The neighbourhoods Featherston designed at Wooranna, the Bialik Year 6 neighbourhood that was created by teachers without design assistance, and the Bialik Prep neighbourhood that was developed by teachers using Featherston’s modular system, all prompt questions about what role school communities, particularly teachers, play in the care, development and maintenance of the material environments of school interiors. The correlation, evident in the photographic data and in the interview transcripts, between teachers’ engagement in shaping their material environments and their perception of their role as either creators, curators or custodians of their neighbourhoods demands further investigation. Particularly given the other correlation evident in the time-lapse sequences between teachers’ level of engagement with the material environment and children’s.

Questions including those raised in the two previous paragraphs are pursued in Chapters 6 and 7, but before they can be properly addressed further explanation of the design of the Bialik and Wooranna neighbourhood interiors is required. The next chapter Documenting Design Patterns for School Interiors presents the design patterns identified in the case neighbourhoods through visual analysis. These patterns expose the design mechanics of the neighbourhood interiors. In particular they illuminate the relationship between the design of specific learning settings and the kinds of learning experiences, activities and behaviours they were designed to promote. The patterns are presented in a linear sequence that helps illustrate the interior design process of designing from the inside out, starting with the smallest design pattern and working outwards to create complex and richly resourced learning environments. The patterns complete the design picture of the case neighbourhoods, against which the other influences that shape learning culture are played out.
5.1 PATTERNS IN THE INTERIOR

As has already been argued, the learning neighbourhoods that Featherston designed at Bialik and Wooranna are significant exemplars of physically complex learning environments. The Bialik Prep neighbourhood and the Wooranna Prep and Years 5/6 neighbourhoods are all composed of multiple interconnected and purposefully designed learning settings, which are well-defined material environments developed as discrete venues for particular kinds of learning experiences. A further significance of these environments is that they reveal an emerging vocabulary of design patterns for school interiors. This chapter documents the interior design patterns identified in the case neighbourhoods by this research and, drawing on C. Alexander et al. (1977), it presents a pattern language for school interiors, specifically learning neighbourhoods. The aim of this pattern language is to describe the design patterns identified in Featherston’s interiors at Bialik and Wooranna in such a way that other designers and school communities can use them to construct similarly rich and complex learning environments.

Visual analysis of the four case neighbourhoods revealed the significance of smaller design patterns in shaping purposeful and meaningful physical environments. The same kinds of patterns were identified in each neighbourhood, although many fewer patterns were identified in the Bialik Year 6 neighbourhood than in the interiors designed by Featherston. The learning settings in the Bialik Year 6 neighbourhood were also the least well defined. Densely layered design patterns in the Wooranna and Bialik Prep neighbourhoods resulted in clearly articulated environmental cues that signaled what learning activities and relationships were appropriate to each setting. Whereas the less densely layered environment of the Bialik Year 6 neighbourhood had fewer environmental cues and fewer distinctions between the purposes of the learning settings. This points to a direct relationship between how densely layered the design patterns are and the purposefulness of each learning setting.
In *A Pattern Language: towns, buildings, construction*, C. Alexander and his colleagues put forward a theory that provides a probable explanation for the differences between the number and density of patterns used in the case neighbourhoods. They use the difference between prose and poetry as an analogy to characterise the difference between buildings that have been created by loosely stringing together a small collection of design patterns, and buildings that have been created through a process of compressing multiple patterns into a given space. The first kind of building, like prose, has one meaning, the other kind of building is richer because its interior environments and exterior surrounds are dense with multiple and layered meanings, like poetry (C. Alexander et al., pp. xli-xliv). The pattern language documented in this chapter includes the small design patterns that may assist school communities and designers to shape purposeful and meaningful interiors by constructing environmental cues to influence children and teachers’ activities and behaviours and hopefully shape new learning cultures.

C. Alexander et al. (1977) define a design pattern as a set of instructions for designing a physical solution to a reoccurring problem in the built environment that is linked to a specific, identifiable human need. The case neighbourhoods that Featherston designed at Bialik and Wooranna each respond to the current need for physical learning environments that facilitate a wide variety of hands-on, collaborative and child-centred learning experiences. The Bialik Prep neighbourhood and the Wooranna Prep and Years 5/6 neighbourhoods represent two different and distinctive examples of the design pattern for learning neighbourhoods. The first, exemplified by the Bialik Prep neighbourhood, describes a small collection of homerooms coupled with shared learning areas. The second describes totally integrated environments, exemplified by the Wooranna neighbourhoods. Although not strictly speaking a concrete example of the design pattern for learning neighbourhoods, the Bialik Year 6 neighbourhood most closely resembles the small collection of homerooms coupled with shared learning areas model. As this chapter will show, a handful of the design patterns identified in the neighbourhoods designed by Featherston were also identified in the Bialik Year 6 neighbourhood.

As concrete examples of the design pattern for learning neighbourhoods both Bialik’s ‘collections of homerooms and shared learning areas’, and Wooranna’s ‘integrated environments’ bring together general learning areas and specialist facilities. The combination of general learning areas and specialist facilities, shared by large numbers of children, constitute the core elements of the design pattern for learning neighbourhoods. The difference is that in the Wooranna neighbourhoods general learning areas and specialist facilities were shared by the whole neighbourhood community and were exclusive to that community. In the Bialik Prep neighbourhood
general learning areas and specialist facilities were duplicated in each homeroom for a single home group to use. The plaza space was shared by the whole Prep community, and additional specialist facilities including the library, art and technology room, and music room were shared with the rest of the ELC.

The design pattern for learning neighbourhoods is composed of smaller patterns for learning settings. The 14 design patterns for learning settings presented in section 5.8, including ‘entry gallery’, ‘studio-lab’ and ‘classroom/workshop’, can be fitted together in different combinations to articulate a pattern language for school interiors, specifically learning neighbourhoods, in the same way that words are arranged in speech to articulate a spoken language. The design pattern for learning settings is composed of smaller design patterns that are organised in categories and presented as separate chapter sections: 5.2 loose items, 5.3 furniture, 5.4 services, facilities and digital technologies, 5.5 walls, floors and surfaces, and 5.6 physical characteristics and spatial organisation. The particular collection of learning settings selected, the interpretation of each pattern, how the patterns are organised, and how circulation routes are used to link them together will produce a learning neighbourhood that is unique to a specific school community. This is because the purpose of design patterns is to articulate the core or essence of a design solution, which means that the same pattern can be executed “a million times over without ever doing it the same way twice” (C. Alexander et al., 1977, p. x).

The structure of the interior design patterns presented in this chapter is loosely modeled on the pattern structure developed by C. Alexander et al. (1977). Each pattern has four components: 1. the pattern title; 2. a short statement of what the pattern is for; 3. a longer statement of how this pattern was expressed in the case neighbourhoods; and 4. an instructional statement for making the pattern. For example, to make Sound Barriers (5.6.6): Determine whether an acoustically separate space or and acoustically sheltered space is required—Quiet Corners (5.6.4), Enclosed Spaces (5.6.7).

Use furniture, fabric or mobile partitions to create acoustically sheltered spaces—Dispersed Storage and Display (5.3.2). Clad walls, floor and ceiling, to increase the rate of sound decade and reduce ambient noise levels—Working Walls and Windows (5.5.1), Material Comfort (5.5.2). The patterns are presented in a linear sequence. The smallest and most fundamental patterns under the category ‘loose items’ are presented first followed by progressively larger patterns up to the largest patterns for learning settings. As the previous example for Sound Barriers demonstrates, the instructional statement for each pattern, except those for the smallest patterns, identifies which smaller patterns, such as Material Comfort (5.5.2), are required to complete it.
The linear sequence used to present the interior design patterns echoes Featherston’s process of designing from the inside out. It starts with the tools and materials (such as pencils and clay) immediate to a particular need or experience, building outwards to furniture design and selection, lighting, degree of enclosure, spatial organisation, the development of learning settings, and finally how to go about assembling learning settings to create a learning neighbourhood. The instructional statements about how to make each pattern are written to guide designers and school communities through a decision-making process for creating physical learning environments that will support the particular learning experiences that they want children and teachers to have.

The learning experiences that a school community wishes to provide and the ways that it wishes to provide them will be driven by the school’s education philosophy and pedagogical vision. And because learning experiences drive this design process, no two learning neighbourhoods will ever be exactly alike.

Implicit in this pattern language for school interiors is an invitation for designers and school communities to help test the robustness of the design patterns. Unlike the design patterns presented by C. Alexander et al. (1977) that are the result of distilling hundreds of built examples into the core elements of each design solution, the interior design patterns documented in this chapter have been identified from a small number of concrete examples at two schools. Therefore the design patterns documented in this chapter require further input from other built examples to round them out into robust design solutions. C. Alexander et al. include a star rating for the robustness of each of their design patterns according to how sure they are that it accurately captures the core elements of the design solution to the problem it responds to. To confirm the robustness of the interior design patterns presented here their veracity needs to be tested, which designers and school communities can do by following the recipes for making each pattern and providing feedback about any modifications that need to be made.
5.2 LOOSE ITEMS

Loose items are tools and resources, such as pencils, rulers, models, posters, plants and artwork for learning and teaching. The particular kinds of loose items that were available in the case neighbourhoods as well as where and how they were stored and displayed, such as the open shelves in Wooranna Years 5/6 Studio Lab shown in Figure 5.1, influenced how children and teachers used them and also how they used each learning setting.

5.2.1 Purposeful Tools, Materials, Resources, Objects and Artefacts

The design pattern for ‘purposeful tools, materials, resources, objects and artefacts’ describes the selection of loose items stored and displayed in each learning setting.

The photographic data from the case neighbourhoods indicates that the specific tools, resources, objects and artefacts selected for each learning setting, as well as the way they were stored and displayed, influenced how children and teachers used and inhabited each setting. This is because loose items provide valuable clues about the function and purpose of a setting. In the lounge setting of Vanessa’s Bialik Prep homeroom there are headphones and a CD player, Figure 5.2. Nearby is a collection of children’s books. These loose items indicate that the lounge setting is a place to read and listen to stories.

In the two Prep neighbourhoods loose items were stored on open shelves immediately beside the work surfaces that children were using, Figure 5.3. Children could see easily what tools, materials and resources were available and as a result they used and consumed them freely. Children were empowered as autonomous learners to decide the mode of expression appropriate to their task (Betts, 1992; Edwards, Gandini & Forman, 1998). Teachers also used objects and artefacts to create learning provocations (Millikan, 2007, May), which they constructed close to children’s work surfaces to capture children’s imagination and provoke further investigation, Figure 5.4.
For Bialik Year 6 children and Wooranna Years 5/6 children the loose items available in their neighbourhood interiors featured less prominently in their learning activities than the personal writing materials they carried with them. In the Wooranna Years 5/6 neighbourhood loose items were not stored as close to children’s work-surfaces as they were in the Prep neighbourhoods, they were also less overtly presented or displayed. For Wooranna teachers managing and storing personal loose items, such as pens, whiteboard markers and water bottles, was a source of frustration. Unlike their Bialik colleagues Wooranna teachers did not have ready accessible personal storage.

To make Purposeful Tools, Materials, Resources, Objects and Artefacts (5.2.1):
Select loose items suited to the purpose of each learning experience and activity. Present and display them so they are inviting and immediate to children’s work-surfaces. Use interesting and unusual objects and artefacts to create engaging and changing displays that encourage children to explore the potential for learning experience embodied in the design of their environment.
5.3 FURNITURE

Furniture had multiple functions in the case neighbourhoods. It was used for seating and work surfaces, housing for services such as plumbing and for storage and display. Furniture was also used to shape the spatial organisation of the neighbourhood interiors. It was used to enclose and separate learning settings, and to make tools, materials and resources easily accessible to children and teachers. These various functions were expressed as two distinct design patterns. ‘Task-specific furniture’ (5.3.1) and ‘dispersed storage and display’ (5.3.2).

5.3.1 Task-specific Furniture

The design pattern for ‘task-specific furniture’ describes the selection of furniture types specifically suited to children’s activities and working postures, Figure 5.5.

Task-specific furniture is a constituent element of the design patterns for learning settings. It describes the functional relationships that are created between different pieces of furniture in each learning setting, such as the relative heights of seating and working surfaces and the proximity of working surfaces to storage units. Task-specific furniture contributes to the environmental cues for each setting because the functional relationships between different pieces of furniture communicate particular working postures, which are clues to possible activities. This pattern is relevant even in settings where no furniture is required, because decisions about what furniture to omit are equally significant as decisions about what furniture to include. More than 50 different furniture types were used in the Wooranna Years 5/6 neighbourhood, Figure 5.6, compared with fewer than 10 different furniture types used in the Bialik Year 6 neighbourhood, Figure 5.7.
FIGURE 5.6 - Various Furniture Types
Wooranna Years 5/6 Neighbourhood
The furniture types marked with * were also used in the Wooranna Prep Neighbourhood
A correspondingly large number of well-defined learning settings in the Wooranna Years 5/6 neighbourhood, Figure 5.8, and a smaller number of poorly defined learning settings in the Bialik Year 6 neighbourhood, Figure 5.9, suggest that the greater the variety of available furniture types the greater the variety and purposefulness of the learning settings. The Bialik Year 6 collaborative space, for example, was furnished with tables and chairs, but had no storage space for tools, equipment and materials. Consequently there were few clues to indicate that the collaborative space had a different purpose to the adjoining homerooms.

**Figure 5.7 - Limited Furniture Types**
Bialik Year 6 Neighbourhood

**Figure 5.8 - Large Number of Well-defined Learning Settings**
Wooranna Years 5/6 Neighbourhood
In the Bialik and Wooranna Prep neighbourhoods more than 20 different furniture types were used to create a similar variety of learning settings in each neighbourhood. There were key differences between the two neighbourhoods though, concerning the furniture types used and the spatial organisation of the learning settings. In the Wooranna Prep neighbourhood task-specific furniture similar to smaller pieces of Years 5/6 furniture was used, Figure 5.6*. In the Bialik Prep neighbourhood a modular furniture system was used throughout, Figure 5.10. The task-specific furniture used in the Wooranna Prep neighbourhood communicated the distinct purpose of each clearly defined learning setting, whereas the learning settings in the Bialik Prep neighbourhood were used for multiple purposes that were communicated through the tools, materials, objects and artefacts stored and displayed in the modular storage units, Figure 5.11.
FIGURE 5.11 - Single Purpose versus Multi-purpose Learning Settings

Wooranna Prep Neighbourhood - Clearly Defined Single Purpose Learning Settings
Bialik Prep Neighbourhood - Layered Multi-purpose Learning Settings
Although the modular furniture system used in the Bialik Prep neighbourhood created a distinctly different interior environment to the Wooranna Prep neighbourhood, there were similarities between these two manifestations of task-specific furniture. Both neighbourhoods were furnished with child-scale furniture that helped identify them as child-centred learning environments, and the design of both neighbourhoods coupled pieces of loose, moveable furniture such as light-weight timber stools, with fixed or built-in pieces. Both neighbourhoods also exploited the visual and material languages of informal, domestic-style upholstered furniture to distinguish the settings that children used for relaxation and reading for pleasure from the settings they used for table-based activities, Figure 5.12.

![Contrasting Furniture Types](image)

**Figure 5.12 - Contrasting Furniture Types**
Wooranna Prep Neighbourhood - Communication Setting for table-based activities (left), - Reading Loft for relaxation and reading for pleasure (right)

An interesting point emerging from the interviews with Prep teachers poses a challenge for task-specific furniture to solve. That is, adults working in child-centred environments, where no provision is made for adults, struggle to use child-scale furniture. Only the PantoFlex Chair, Figure 5.6, was regarded positively by Prep teachers as one they could use. Wooranna Prep teacher, Kate described it as “the most comfortable school children’s chair I’ve used”.

To make Task-specific Furniture (5.3.1): *Select individual pieces of furniture that address the specific functional requirements of particular tasks and support good working postures. Combine different furniture types to create functional relationships between seating, work surfaces and storage for learning and teaching resources. Select furniture that is the appropriate size for the children and adults who will use it.*
5.3.2 Dispersed Storage and Display

The design pattern for ‘dispersed storage and display’ details the selection of furniture to store and display children’s work and the selection of furniture to store and display the tools, materials and resources pertinent to the activities of each learning setting. Figure 5.13. This pattern closely relates to the design pattern for ‘purposeful tools, materials, resources, objects and artefacts’ because it responds to the need to decentralize the storage of learning and teaching tools, materials and resources. ‘Dispersed storage and display’ is integral to the design pattern for learning settings because its function is to give children and teachers access to the things they need when and where they need them. In the Wooranna case neighbourhoods storage and display units were also used to divide neighbourhood environments into learning settings. Implicit in the design pattern for dispersed storage and display are characteristics of transparency and accessibility including open shelves, clear storage containers, and things stored close to work surfaces where children can reach them, Figure 5.14.

**TO MAKE DISPERSED STORAGE AND DISPLAY (5.3.2):** Determine what is to be stored or displayed and—Purposeful Tools, Material, Resources, Objects and Artefacts (5.2.1). Decide what relationship the storage or display units will have to other pieces of furniture in the learning setting—Task-specific Furniture (5.3.1). Examine what opportunities exist to use the selected storage or display units to help define the perimeter of a learning setting or to separate one setting from another.
STORAGE AND DISPLAY

Tub Trolley  Storage Cabinet  Wire Basket Trolley  Built in Shelving  Lunch Order Box & Sign-in Ledge

T - Screens  Adjustable Open Metal Shelves  Open Frame Shelves  Open Shelves

Billy Bookcase  Open Shelves  Mobile Drying Rack  Wall Shelves  Large Paper Shelves

Student Lockers  2D & 3D Wall Display  Prespex Display Case  Office Draws  Mobile Whiteboard

Table Top & Storage/Display Units  Double Sided Shelves  Artefact Drawers

FIGURE 5.14 - Storage and Display Types
Wooranna Years 5/6 Neighbourhood
5.4 SERVICES, FACILITIES AND DIGITAL TECHNOLOGIES

So called specialist services, facilities and digital technologies, such as plumbing, ovens, and computers, that were once housed in separate art rooms, kitchens and computer labs are now being integrated with general learning areas to create learning neighbourhoods.

5.4.1 Integrated Environments

The design pattern ‘integrated environments’ responds to the need for children and teachers to have unrestricted access to specialist equipment and resources. It governs the integration of specialist services and facilities such as sinks and data boxes and also the distribution of digital technologies including desktop computers and electronic whiteboards. Key to this design pattern is selecting services, facilities and digital technologies appropriate to the purpose each learning setting, Figure 5.15.

For example, the mini-studios in the Bialik Prep neighbourhoods and studio labs in the Wooranna neighbourhoods were all plumbed with sinks and running water, services that are essential for wet and messy art and science activities, Figure 5.16.

**FIGURE 5.15 - Integrated Environments**
- Digital Technologies
  Wooranna Years 5/6 Neighbourhood
- Digital Interactive Space

**FIGURE 5.16 - Sinks Enable Wet, Messy Activities**
Bialik Prep Neighbourhood - Mini-studio (left), Wooranna Prep Neighbourhood - Studio Lab (right)
Computer technology was integrated throughout the Wooranna case neighbourhoods. In settings such as the Years 5/6 media hub, desktop computers were the central focus of children’s activities, which included digital animation and robotics programming, Figure 5.17. In other settings, including the Years 5/6 quiet study and the studio lab, computers were used for research, reference and word processing in support of learning activities such as creative writing and art investigations, Figure 5.18. In the Wooranna Prep neighbourhood computers were primarily used for word processing and literacy and numeracy games, Figure 5.19. Other digital technologies, such as the iPods installed in the lower level of the reading loft served a more specific purpose for listening to audio books, Figure 5.20.

Each of the Bialik Prep and Year 6 homerooms has a pair of desktop computers that children used for word processing and educational games, Figure 5.21. Teachers used the same computers for administration. Aaron’s Year 6 homeroom and Vanessa’s Prep homeroom also each had an electronic whiteboard. Both teachers used their e-board
extensively as a tool for demonstration and instruction and as an interactive digital interface for children to use, Figure 5.22.

TO MAKE INTEGRATED ENVIRONMENTS (5.4.1): Decide what specialist equipment and resources are required. Consider what furniture such as seating, work-surfaces or storage is required to house or use the equipment and resources—Task-specific Furniture (5.3.1), Dispersed Storage and Display (5.3.2). Locate the equipment and resources taking into account environmental factors such as lighting—Location, Location (5.6.8), Appropriate Light and Shade (5.7.1).

5.5 WALLS, FLOORS AND SURFACES
The finish of walls and partitions, floors and steps, and surfaces including tables, chairs and workbenches influences the ways that children and teachers use and interact with their interior environment.

5.5.1 Working Walls and Windows

FIGURE 5.21 - Digital Games
Bialik Prep Neighbourhood, Dawn’s Homeroom

FIGURE 5.22 - Electronic Whiteboard
Bialik Year 6 Neighbourhood, Aaron’s Homeroom

FIGURE 5.23 - Working Walls and Windows
Wooranna Years 5/6 Neighbourhood, Games and Construction
‘Working walls and windows’ describes the customised design, finish or treatment of vertical elements in interior environments to suit specific purposes.

In the Wooranna Prep neighbourhood customised vertical partitions called T-screens were used to enclose small role-play settings, Figure 5.24. In the Wooranna Years 5/6 neighbourhood a sliding glass wall was used to link and separate two adjoining learning settings, Figure 5.25. It is significant that a glass wall was used. As well as the physical function of the sliding partition, it provided a visual connection between the two settings. Internal windows used in the two Prep neighbourhoods were also used for this purpose. Large sections of the interior walls of the Wooranna case neighbourhoods were clad with pin board material to create a self-healing, reusable display surface, Figure 5.26. Walls and ceilings can be treated acoustically by lining them with carpet or introducing sound baffle screens or wall panels, Figure 5.27.

**FIGURE 5.24** - *T-Screen*
Wooranna Prep Neighbourhood - Role Play Setting

**FIGURE 5.25** - *Sliding Door and Windows*
Wooranna Years 5/6 Neighbourhood - Quiet Study and Classroom Workshop

**FIGURE 5.26** - *Pin Board Cladding*
Wooranna Prep Neighbourhood - Entry Gallery

**FIGURE 5.27** - *Carpeted Walls*
Wooranna Prep Neighbourhood - Amphitheatre

**TO MAKE WORKING WALLS AND WINDOWS (5.5.1): Select the construction or cladding materials for walls and windows to enhance the contribution of those surfaces to the learning environment.**
5.5.2 Material Comfort

‘Material comfort’ refers to the tactile qualities of the surfaces that children and teachers interact with in their learning neighbourhoods. This design pattern articulates the connection between how something feels and the way that people use and interact with it (Figure 5.28). In the Wooranna Prep neighbourhood there were two examples of the necessary balance between the durability and the feel of the materials used. The smooth compact weave of the hard wearing carpet in the amphitheatre was warm and comfortable to sit on (Figure 5.27). Equally comfortable was the Flotex flooring used in the studio lab that had the washable qualities of linoleum, and a flocked finish similar to short pile carpet (Figure 5.29). Material comfort is equally important in the feel of work surfaces. Work surfaces should be made from a material this is easy to clean, will not easily scratch or chip and is not cold or hot to touch (Figure 5.30).

To make Material Comfort (5.5.2): Select furnishing materials and surface finishes with human touch in mind—Task-specific Furniture (5.3.1), Working Walls and Windows (5.5.1). Select functionally appropriate materials that will also be comfortable to touch.
5.6 PHYSICAL CHARACTERISTICS AND SPATIAL ORGANISATION

Spatial characteristics are the physical attributes of a space, place or environment including the scale, proportions and configuration of space; floor levels and ceiling heights; and the degree of visual connection, acoustic separation and physical enclosure.

For some design patterns, especially those for learning settings, specific spatial characteristics are key to the character of the settings created using that pattern. For other patterns, spatial characteristics are less integral and can be varied to customise design patterns for specific applications. For example, the games and construction settings in the Bialik Prep neighbourhood and Wooranna Prep and Years 5/6 neighbourhoods were all unobstructed, visually connected and acoustically exposed spaces, Figures 5.31 & 5.32. However, the construction settings in the Bialik and Wooranna Prep neighbourhoods were open and linked to neighbouring settings whereas the Wooranna Years 5/6 games and construction setting is partially enclosed with a raised floor, Figure 5.32.

Neither the degree of physical enclosure nor the floor level are integral to the design pattern for ‘games and construction’ settings (5.8.3), but these two spatial characteristics have been used to customise the games and construction setting in the Wooranna Years 5/6 neighbourhood. By raising the floor and partially enclosing this setting, Featherston has created a setting that is intimate enough to play chess and other board games in as well as being open enough for large-scale construction.
5.6.1 Scale to Suit

‘Scale to suit’ refers to selecting or creating learning settings that are the appropriate size and dimensions for the activities they are designed to facilitate, Figure 5.33.

Visual analysis of the case neighbourhoods indicates that small spaces are suitable for small group activities where children work closely together, such as the settings for target teaching and small group discussion in the Wooranna Years 5/6 neighbourhood, Figure 5.34. Whereas large spaces, such as the Bialik Prep plaza and the Wooranna Prep problem-solving and construction settings, are suitable for large numbers of children working in multiple small groups or as a whole group for activities such as role play and movement, Figure 5.35. The transcripts of the interviews with teachers indicate that smaller, more intimate spaces encouraged children to speak quietly, whereas larger spaces encouraged boisterous activities.

TO MAKE Scale to Suit (5.6.1): Determine the appropriate size and dimensions of a learning setting or environment according to how many children or teachers will use it at any given time, what working relationships they will have, and what activities they will be doing.
5.6.2 Low Ceiling, High Ceiling

‘Low ceiling, high ceiling’ describes the effect that raising or lowering the ceiling height has on the ambience of a learning setting, Figure 5.36.

The entry galleries into the Wooranna case neighbourhoods were intimate spaces with low ceilings that created a sense of arrival on entering each neighbourhood. The learning spaces on either side of the entry galleries had high sloping ceilings that added to the effect of the neighbourhoods opening up and expanding out from the entrance, Figure 5.37 (left). Low ceilings can be created by hanging or suspending something from the existing ceiling to simulate a low ceiling such as the fabric sail suspended over the role-play settings in the Wooranna Prep neighbourhood, Figure 5.37 (right).

TO MAKE LOW CEILING, HIGH CEILING (5.6.2): Lower the ceiling to create a more intimate space, and promote hushed voices. Raise the ceiling to create public space and promote boisterous activity.
5.6.3 Raised Floor

‘Raised floor’ details the effect of altering the floor level in learning neighbourhoods to create vantage points and landmarks, Figure 5.38.

Featherston’s elevation of the Wooranna Years 5/6 ‘games and construction setting’ above the neighbourhood floor level signaled that it was a privileged space designed for activities that were different to those in the adjacent settings, Figure 5.39. Although the elevation was small it gave children a different vantage point to view their neighbourhood from. The upper story of the Wooranna Prep reading loft had a much higher elevation and provided children with a bird’s-eye view of part of their neighbourhood, Figure 5.40. C. Alexander et al. (1977, pp. 315-318) suggest that high places have a dual function, as a place to survey the world from and as a landmark for navigating on the ground. The significant elevation of the Prep reading loft and its striking orange colour mean it served these two functions well.

**TO MAKE Raised Floor (5.6.3):** Create places within learning neighbourhoods that function as a look out and as a landmark. Position them on the main circulation route where they can be seen from most places in the neighbourhood—Location, Location (5.6.8), Circulation Routes (5.6.9).
5.6.4 Quiet Corners

‘Quiet corners’ describe physically enclosed places away from the main circulation route and noisy activities. These places are withdrawal spaces for small group discussions, individual study or reading, Figure 5.41.

Key characteristics of quiet corners are that they are sheltered from the noise of the neighbourhood, but still acoustically connected to neighbourhood activities. These are quiet places, not silent spaces. The target teaching in the Wooranna Prep neighbourhood, for example, was a partially enclosed space, removed from the main circulation route, and shielded from noise, Figure 5.42. Lounge settings in the Bialik Prep neighbourhood also occupied quiet corners, but they were less sheltered from the noise of other homeroom activities, Figure 5.43. The interviews with teachers indicated a desire for acoustically separate settings as well as acoustically sheltered ones.

**FIGURE 5.41 - Quiet Corners**
Wooranna Years 5/6 Neighbourhood
- Reading Nook in Upstairs Quiet Study

**FIGURE 5.42 - Acoustically Protected**
Wooranna Prep Neighbourhood
- Target Teaching Setting

**FIGURE 5.43 - Acoustically Connected**
Bialik Prep Neighbourhood, Dawn’s Homeroom
- Lounge

**TO MAKE QUIET CORNERS (5.6.4):** Choose a place well away from the main circulation route, ideally a corner. Employ appropriate strategies for screening of excluding noise and locate settings for other quiet activities adjacent—Sound Barriers (5.6.6), Location, Location (5.6.8).
5.6.5 Connected Views

‘Connect views’ can be used to create visual links between neighbouring learning settings, to create visually transparent environments, or both, Figure 5.44.

Visually transparent learning environments are reported to help individuals to feel connected to their learning community (DEECD, 2008b), increase opportunities for children and teachers to observe practices and behaviours modeled by others, and help make the process of learning visible (DfES, 2004a; Nair & Fielding, 2005). Architectural openings, internal windows and glass doors are devices used to create connect views in the case neighbourhoods. In the Bialik Prep neighbourhood, glazed walls were used to enclose and acoustically separate the mini-studios from the homerooms, Figure 5.45. Whereas in the Wooranna Years 5/6 neighbourhood a large architectural opening was used to connect the studio-lab to the rest of the neighbourhood, Figure 5.46.

TO MAKE CONNECTED VIEWS (5.6.5): Decide the relationship between neighbouring settings in a neighbourhood. If a setting is visually connected to other settings, does it also need to be acooustically separate or physically enclosed? Select the appropriate device to create those connections and/or separations—Sound Barriers (5.6.6), Enclosed Spaces (5.6.7).
5.6.6 Sound Barriers

‘Sound barriers’ screen, contain or exclude sound, Figure 5.47. They can also be used to modify the acoustic quality of individual settings.

Noise management was identified as a key issue of concern by the teachers working in the semi-open plan environments at Wooranna. This indicates that strategies for managing noise by screening, containing or excluding it are critical to creating comfortable learning neighbourhoods. The doors to the Bialik Prep and Year 6 homerooms could be closed to exclude noise, but the time-lapse sequences show that they were usually left open. The classroom workshop and quiet study in the Wooranna Years 5/6 neighbourhood, and the mini-studios in the Bialik Prep neighbourhood, were specifically designed to function as acoustically separate spaces, Figure 5.48. Other settings, such as the Wooranna Years 5/6 target teaching setting were designed as acoustically sheltered spaces, Figure 5.49.

To make Sound Barriers (5.6.6): Determine whether an acoustically separate space or and acoustically sheltered space is required—Quiet Corners (5.6.4), Enclosed Spaces (5.6.7). Use furniture, fabric or mobile partitions to create acoustically sheltered spaces—Dispersed Storage and Display (5.3.2). Clad walls, floor and ceiling, to increase the rate of sound decade and reduce ambient noise levels—Working Walls and Windows (5.5.1), Material Comfort (5.5.2).
5.6.7 Enclosed Spaces

‘Enclosed spaces’ are settings that can be physically separated from other settings.

In the case neighbourhoods enclosed spaces were used to contain particular learning activities and exclude others. Enclosed spaces like the Wooranna Years 5/6 audio studio were designed to exclude sound, Figure 5.50. The shared withdrawal spaces in the Bialik Prep neighbourhood were designed to separate children’s activities from the rest of the neighbourhood. Solid walls and doors were used to avoid visual distractions as well as to contain and exclude noise, Figure 5.51. The mini-studios in the Bialik Prep neighbourhood were also designed to separate children’s activities from the rest of the neighbourhood, but glazed walls were used to exclude noise and maintain visual connections with the other homeroom settings, Figure 5.52.

**FIGURE 5.50 - Enclosed Spaces**
Wooranna Years 5/6 Neighbourhood
- Audio Studio

**FIGURE 5.51 - Separate Spaces**
Bialik Prep Neighbourhood, Vanessa and Dawn’s
- Shared Withdrawal Space

**FIGURE 5.52 - Visually Connected Enclosed Spaces**
Bialik Prep Neighbourhood
- Mini-studio

To make Enclosed Spaces (5.6.7): Use solid walls to enclose settings that need to be visually and acoustically disconnected from other settings. Use glazed walls and internal windows to enclose settings that need to be visually connected, but acoustically separate from other settings—Connected Views (5.6.5), Sound Barriers (5.6.6).
5.6.8 Location, Location

‘Location, location’ refers to the position of each setting on the neighbourhood floor plan and its relationship to other settings, Figure 5.53.

Examples identified in the case neighbourhoods indicate that the location of individual settings within a learning environment influences how they function. Some settings, such as neighbourhood lounges, that functioned as social hubs needed to be close to the central circulation route, while others such as quiet study settings needed to be located away from it, Figures 5.53 & 5.54.
However there were locational differences between the case neighbourhoods. In the Wooranna Years 5/6 neighbourhood, the setting for small group discussion was located in a quiet corner away from the main circulation route to promote children’s independent learning. In the Prep neighbourhoods, the small group discussion settings were located on the main circulation path to encourage children to model collaborative behaviours for their peers, Figure 5.54. Environmental factors also influenced the location of particular settings. The Wooranna studio labs, for example, were located on the northeast side of each neighbourhood to take advantage of the abundant natural light needed to support children’s visual art activities, Figures 5.53.

**TO MAKE LOCATION, LOCATION (5.6.8):** Locate each setting to take advantage of specific environmental conditions that may vary across the neighbourhood plan—Appropriate Light and Shade (5.7.1). Consider whether each setting should be on the main circulation route or removed from it—Circulation Routes (5.6.9), Quiet Corners (5.6.4).

### 5.6.9 Circulation Routes

‘Circulation routes’ are the pathways through built environments that people follow to move from one learning setting to another.

**TO MAKE CIRCULATION ROUTES (5.6.9):** Use circulation routes to link learning settings and promote movement between settings. Use a tree and branch structure with a broad pathway into the heart of the neighbourhood and smaller paths leading to each learning setting, Figure 5.55. Avoid circular pathways, which can create choke points and congestion, Figure 5.56.
CHAPTER 5: DOCUMENTING DESIGN PATTERNS FOR SCHOOL INTERIORS

5.7 LIGHTING

Lighting is critically important in creating comfortable working conditions in learning environments. In the case neighbourhoods a general lighting state, similar conventional classroom lighting, was created using a combination of natural light from external windows and ceiling-mounted fluorescent strip lighting. This combination produced a bright, even light suitable for reading and writing activities. Arguably, the range of different learning activities being introduced in contemporary learning environments requires a variety of different lighting states to achieve desirable functional and ambient lighting effects.

5.7.1 Appropriate Light and Shade

‘Appropriate light and shade’ describes the use of shade and illumination, both natural and artificial, to support children’s various learning activities, Figure 5.57.

In the case neighbourhoods the design pattern for appropriate light and shade was expressed in two ways. The first, in the ways that teachers managed natural light levels according to what learning activities children were doing. The second, via the use of artificial light sources that teachers used to create ambiences that were different to the one created by the general lighting state. As mentioned earlier, the studio labs in the Wooranna neighbourhoods were located on the northeast side of the buildings to take advantage of the abundant natural light. Teachers in each neighbourhood created darkened spaces suitable for AV presentations by turning off lights and closing blinds to exclude natural light, and where possible computer monitors, electronic whiteboards and data projectors were located away from windows to avoid solar interference, Figure 5.58.
Artificial light was used to shape users’ experience of the physical environment. In this way the metaphoric contribution that artificial light made to material environment in particular settings was more significant than the illumination it supplied (Burke, 2005b). For example, specifically focused downlights in the Wooranna entry galleries were used to highlight displays of children’s work. More importantly, they provided a clear environmental cue signaling the transition from the public areas of the school into the private zones of the learning neighbourhoods (Nair & Fielding, 2005; A. Taylor & Vlastos, 1975). Bialik Prep teacher, Vanessa regularly altered the lighting state in her homeroom to create a calm and restful ambience for periods of learning reflection. She did this by turning off the main lights, closing the blinds on the external windows and turning on two ceiling mounted lights that produced a soft warm light, Figure 5.59. Wooranna Prep teachers also periodically turned off the main lights in their neighbourhood to create a more subdued and relaxed daylight state.

TO MAKE APPROPRIATE LIGHT AND SHADE (5.7.1): Use natural and artificial light to create sufficient illumination for general work activities. Use blinds to exclude unwanted natural light particularly where computer monitors and AV equipment is being used. Use additional artificial light to vary the ambience in particular learning settings.

5.8 LEARNING SETTINGS

Learning settings are spaces and places that have been purposefully designed for particular kinds of learning activities. The design pattern for each learning setting explains what kinds of learning activities it is for and the kinds of learning relationships and experiences it is designed to promote. Examples from the case neighbourhoods are used to illustrate each pattern and to demonstrate variations between different expressions of the same pattern. Instructions for how to build or create each learning setting include the smaller design patterns discussed previously.
5.8.1 *Entry Gallery*

‘Entry galleries’ are gateway settings designed to regulate the transition from the public areas of a school into the private zone of a learning neighbourhood. They are reception areas where children record their attendance and place lunch orders. Entry galleries also function as exhibition spaces for children’s work, communicating neighbourhood learning activities to visitors and the wider school community, Figure 5.60.

The design pattern for entry galleries, which are easily identifiable by their characteristic linear form, was expressed in two different forms across the case neighbourhoods. The Wooranna entry galleries were close, intimate, narrow corridors painted white and hung with examples of children’s work, some behind Perspex. Learning portfolios were neatly arranged on open shelves and carefully focused downlights highlighted examples of children’s work, Figure 5.61. In contrast, the Bialik plaza space was expansive and filled with natural light. Children’s three-dimensional constructions were displayed on the floor and examples of their other work were mounted on white walls, Figure 5.62.
To make Entry Gallery (5.8.1): Create an area to welcome visitors into a learning neighbourhood. In it display children’s work—Distributed Storage and Display (5.3.2), Purposeful Tools, Resources, Objects and Artefacts (5.2.1), and light the displays to draw people into and through the gallery to the neighbourhood beyond—Appropriate Light and Shade (5.7.1).

5.8.2 Study

‘Study’ settings are where children work alone or in small groups for individual and collaborative study. These settings are for table-based reading and writing activities, Figure 5.63.

Attributes common to the study settings in the case neighbourhoods were bright even lighting, chairs and tables organised in small clusters, and small numbers of desktop computers. The spatial characteristics of these settings varied. The Bialik Year 6 homerooms, for example, were physically enclosed and acoustically separate study settings, whereas the study settings in the Bialik and Wooranna Prep neighbourhoods were open environments physically, visually and acoustically connected to the settings for other activities, Figure 5.64. In the Wooranna Years 5/6 neighbourhood there were both physically enclosed and acoustically separate study settings, Figures 5.65, and studies that were open to other settings, Figure 5.66. Quieter, more enclosed studies lent themselves more easily to individual study and focused concentration, whereas more open study settings, sometimes referred to as learning commons (Nair & Fielding, 2005), were better suited to collaborative study. Individual and collaborative study behaviours were observed in both kinds of study settings.
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TO MAKE STUDY (5.8.2): Select writing equipment and reading material relevant to children’s current learning investigations—Purposeful Tools, Resources, Objects and Artefacts (5.2.1). Store and display them on open shelves—Distributed Storage and Display (5.3.2). Decide how many children will work in this setting at any one time and choose the same number of child-sized tables and chairs with good ergonomic support for longer periods of seated activity—Task-specific Furniture (5.3.1). Arrange them in clusters so that two or four children can work together or work alone in the company of others. Include a small number of computers at a ratio of one computer per five children—Integrated Environments (5.4.1). Locate this setting away from the main circulation route and ensure that there is bright even lighting and that computer monitors are not affected by solar glare—Location, Location (5.6.8), Appropriate Light and Shade (5.7.1).
5.8.3 Games and Construction

‘Games and construction’ settings are for playing board games and card games and for building things. Children have opportunities to develop social relationships and learn through social interaction, Figure 5.67.

The Wooranna Years 5/6 games and construction setting was a partially enclosed and unobstructed space on a raised platform. Games of all shapes and sizes were stored on low open shelving units. There were three small square side tables and three pairs of ottomans for playing board games where children also left chess games in progress, Figure 5.68. No evidence of children’s construction activities or construction materials was identified in the observation data. In the Wooranna Prep neighbourhood, open storage shelves were used to divide the large area for games and construction into zones for large-scale construction, small-scale construction and games, Figure 5.69. The foam blocks in the large-scale construction area were continually transformed into new constructions. Small-scale constructions made from cardboard cones, plastic tubes and clothes pegs were displayed on low platforms as children continued to work on them. Typically children played on the floor in the games setting. Sometimes they played
at the tables. Bialik Prep children played games such as *Maths Twister* in their plaza space. There were also several dedicated zones for small-scale construction in the plaza space, each resourced with specific construction materials such as timber blocks or cardboard cones, Figure 5.70. Bialik Prep children also used the unobstructed home group areas in their homerooms for games and small-scale construction.

**Figure 5.69 - Problem Solving and Construction**
Wooranna Prep Neighbourhood - Problem Solving Setting (left), Construction Settings (right)

**Figure 5.70 - Playing Games and Building Things**
Bialik Prep Neighbourhood - Plaza Space, Maths Game (left), Timber Block Constructions (right)

To make Games and Construction (5.8.3): Choose games and construction materials appropriate to the interests and development level of the neighbourhood cohort—Purposeful Tools, Resources, Objects and Artefacts (5.2.1) and store them on open shelves at child height—Dispersed Storage and Display (5.3.2). Use the storage and units to partly enclose enough unobstructed space for up to five children to work together—Scale to Suit (5.6.1), Enclosed Spaces (5.6.7). Include at least one surface for building on and storing work in progress and consider whether seating and a surface for playing board games are also appropriate—Task-specific Furniture (5.3.1), Dispersed Storage and Display (5.3.2). Ensure lighting is bright and even—Appropriate Light and Shade (5.7.1) and that the floor surface is comfortable for sitting and kneeling on—Material Comfort (5.5.2).
5.8.4 Discussion Group

‘Discussion group’ settings are venues where groups of up to five children can hold an autonomous discussion, Figure 5.71. Group members have a collaborative democratic relationship with each other and their activities have a common focus.

The Wooranna Years 5/6 discussion group setting occupied one corner of the neighbourhood and was partly enclosed on the other two sides by child-scale lockers. The lockers provided some acoustic separation from other settings and created an autonomous place for children away from direct teacher supervision. In the Bialik Year 6 neighbourhood, where children frequently formed small discussion groups, these activities were conducted at tables in their homerooms and in the shared collaborative space. Discussion group settings in the Prep neighbourhoods were physically, acoustically and visually connected to the rest of the learning neighbourhoods, Figure 5.72.

TO MAKE Discussion Group (5.8.4): Arrange five child-scale ergonomic chairs around a round table just large enough to accommodate them comfortably—Task-specific Furniture (5.3.1). Locate this setting away from the main circulation route and ensure that there is bright even lighting—Location, Location (5.6.8), Appropriate Light and Shade (5.7.1).
5.8.5 Target Teaching

Target teaching settings are for one teacher working with a group of up to eight children on consolidating or extending specific skills. These are intimate working relationships.

The Wooranna Years 5/6 target teaching setting was a small corner setting containing freestanding narrow open shelves, a wall-mounted conventional whiteboard, an oval table, and nine chairs. Banks of lockers were used to partly enclose the setting and shelter it from neighbourhood noise, Figure 5.73. The target teaching settings in both Prep neighbourhoods were small spaces with large windows onto neighbouring settings. The Wooranna Prep target teaching setting was a sheltered, but not separate, rectangular space with storage cupboards and a bench at one end and a rectangular table and stools in the centre, Figure 5.74. Target teaching in the Bialik Prep homerooms was conducted on stools arranged around a large square table positioned in the centre of the mini-studios, Figure 5.75. The doors connecting the mini-studios to the rest of the homeroom could be closed to create quiet, acoustically separate places.
5.8.6 Classroom Workshop

Similar to conventional classrooms, ‘classroom workshops’ are settings for direct instruction, large group discussions, reading and writing tasks, and AV presentations. In these settings children participate in debating, public speaking, peer discussions, taking notes reading texts and preparing written responses. Teachers also use them to immerse children in new topics for learning investigations (O’Loughlin, 2003).

Wooranna’s Years 5/6 classroom workshop was a self-contained room with a teacher’s table and chair, twenty-five child-scale tablet chairs, and an e-whiteboard, Figure 5.76. The tablet chairs were arranged in different configurations for different activities, including facing the electronic whiteboard for direct instruction or arranged in a large circle for whole group discussions. They were also arranged in two separate groups for a parliamentary-style debate, and in clusters for small group discussions.
Each of the Bialik Year 6 homerooms functioned as classroom workshops, and children and teachers rearranged the furniture to suit their specific needs. In Judith’s homeroom large group discussions were usually conducted in a small setting they called a social circle, Figure 5.77. The Prep learning communities used their home group areas for whole group discussions and some direct instruction. Bialik Prep children sat in a circle on the floor so they could see the e-whiteboard, Figure 5.78, and Wooranna Prep children watched AV presentations in the amphitheatre.

**TO MAKE CLASSROOM WORKSHOP (5.8.6)**: Select seating and work surfaces for children that they can quickly and easily reconfigure for a variety of learning activities, plus a work surface for teachers to set-up a laptop computer and organise handouts—Task-specific Furniture (5.3.1). Include a wall-mounted e-whiteboard, dimmable lights, and window coverings to create an even general lighting state and to exclude natural light during presentations—Integrated Environments (5.4.1), Appropriate Light and Shade (5.7.1). Choose wall coverings that promote the display of posters and children’s work and include low shelves to store reading, writing and teaching materials and for displaying objects and artefacts pertinent to current learning investigations—Working Walls and Windows (5.5.1), Purposeful Tools, Resources, Objects and Artefacts (5.2.1), Dispersed Storage and Display (5.3.2). This setting should be large enough to comfortably arrange children’s seating and work surfaces in a single circle. It should be a quiet enclosed space with some visual connection to neighbouring settings—Connected Views (5.6.5), Sound Barriers (5.6.6), Enclosed Spaces (5.6.7).
5.8.7 Child-teacher Conference

‘Child-teacher conference’ settings are where brief weekly meetings between each child and their supervising teacher are conducted as part of the daily neighbourhood routine. Child and teacher set learning goals and the teacher tracks the child’s progress.

The conference setting in the Wooranna Years 5/6 neighbourhood consisted of a casual dining table and chairs informally arranged in one corner of the entry gallery, Figure 5.79. Conferences and conference settings in the Bialik Year 6 neighbourhood and the two Prep neighbourhoods were less formal. Bialik Year 6 children met with teachers as required at one of the tables in the shared collaborative space and Prep teachers tracked children’s progress via learning agreement sheets filled in during home group periods, Figure 5.81.

TO MAKE Child-teacher Conference (5.8.7): Select informal seating and a work surface for two people that will put both teacher and child at ease and allow them to comfortably review the child’s learning progress—Task-specific Furniture (5.3.1). Arrange the furniture in a semi-enclosed and quiet corner of the neighbourhood away from noise and distraction—Quiet Corners (5.6.4), Sound Barriers (5.6.6), Location, Location (5.6.8). Use subdued lighting to create a relaxed ambience—Appropriate Light and Shade (5.7.1).
5.8.8 Reading Nook

Reading nooks are small, cozy, semi-enclosed settings for informal study and recreational reading, Figure 5.82.

Wooranna’s Years 5/6 reading nook was a small setting for two children furnished with beanbags. It was partly enclosed by a small bookshelf and occupied one corner of the quiet study, Figure 5.83. The upper and lower levels of the reading loft in the Prep neighbourhood were reading nooks for up to six children, Figure 5.84. Soft couches and encircling walls created nurturing places. Each level had a small collection of books displayed on open shelves. The lower level also had listening posts (wall-mounted iPods for listening to audio books) plus a wide screen TV for watching DVDs.

Included in the modular furniture system Featherston designed for the Bialik ELC was a reading nook just large enough for one child, with a curtain so children could use them as private spaces, Figure 5.82. Bialik Prep children also used their lounge settings as reading nooks, Figure 5.85. In the Bialik Year 6 neighbourhood children used cushions and fat mats to create reading nooks tucked into corners, behind doors and between tables, Figure 5.86. Only Judith’s homeroom had a fixed setting approximating a reading nook. It was a small cubby in one corner enclosed by a book self, furnished with cushions and topped with a cardboard roof made by the children.
5.8.9 Studio-lab

‘Studio-labs’ are settings for wet and messy activities such as art and science experiments. Children may be engaged in discrete activities or longer investigation projects. They may be working independently or in collaboration with peers, Figure 5.87. Studio-labs are highly visible settings where the products of children’s learning investigations are always on display whether or not children are working on them.
In the Wooranna Years 5/6 studio-lab children had easy access to a wide range of materials, equipment, tools and technologies for learning experiences as diverse as model making, construction, science experiments and visual art. Tall rectangular tables with bar stools support sitting or standing work postures, Figure 5.88. Lower tables with timber stools provided good support for short periods of seated activity within the flow of activities in the setting. The Bialik mini-studios were small self-contained settings for up to eight children. Each mini-studio had bright artificial lighting, washable flooring, a sink with running water, a collection art tools and materials stored on open shelves, a large work-surface with wooden stools, and a drying rack to store children’s artwork.

**Figure 5.88 - Two Working Heights**
Wooranna Years 5/6 Neighbourhood - Studio-lab

**Figure 5.89 - Mini-studio**
Bialik Prep Neighbourhood, Sophie’s Homeroom - Mini-studio

To make Studio-Lab (5.8.9): Establish a collection of materials such as wire, newspaper, glue, fabric, twine, paints and dyes, and basic ingredients such as vinegar and bicarb soda for simple chemical reactions. Continually introduce new materials to the collection to support current learning investigations and house all materials in clear plastic containers on open shelves—Purposeful Tools, Resources, Objects and Artefacts (5.2.1), Dispersed Storage and Display (5.3.2). Choose a variety of work surfaces such as easels, tables for standing work, and tables for seated work—Task-specific Furniture (5.3.1). Cluster two or three work surfaces together to promote collaboration and allow free movement throughout the setting—Circulation Routes (5.5.9). Include storage and display space for two and three-dimensional work as well as storage for wet work and work in progress—Dispersed Storage and Display (5.3.2). Include a small number of computers at a ratio of one computer per five children—Integrated Environments (5.4.1). Use washable flooring—Material Comfort (5.5.2). Locate this setting to take advantage of daylight, supplement with bright artificial light and position desktop computers to avoid solar glare and light reflections—Appropriate Light and Shade (5.7.1).
5.8.10 Neighbourhood Lounge

The ‘neighbourhood lounge’ is the social and metaphoric heart of the neighbourhood used by children for social recreation and informal collaboration. It is also an informal meeting place for teachers and somewhere for parents to sit with their children.

The Wooranna Years 5/6 lounge was a built-in custom designed lounge settee and six ottomans upholstered in red vinyl, suggestive of a leather lounge. The setting was sheltered by a curved red screen and at its centre is a low round table, reminiscent of a coffee table, Figure 5.90. It was a hub of social activity, including collaborative learning and informal teacher meetings. Two smaller settings for social recreation, an outdoor balcony and a small snack table were less frequently used. The Wooranna Prep lounge was a small alcove linked to the entry gallery furnished with two child-scale vinyl couches. Separated from the target teaching setting by a large fish tank, Figure 5.91, this cozy corner was an important social space for parents and younger siblings. It was also a comforting restful place for Prep children to relax or nap. Teachers use this setting to prepare work and conduct informal meetings. The Bialik Prep lounges were small cozy settings furnished with two child-scale couches upholstered in deep green plush fabric, Figure 5.92. Children use these settings for socialising, reading, resting and napping.
5.8.11 Audio Studio

‘Audio studios’ are settings for audio experimentation and production. They are equipped for sampling, mixing and producing audio material, and may be connected to separate audio recording facilities such as a recording booth.

The Wooranna Years 5/6 audio studio is large enough for three children to work comfortably at a single workbench sharing one desktop computer and a mixing desk, Figure 5.93. The workbench faced a window into the movement and performance space, which provided opportunities for children to create soundscapes to accompany movement and performance. The audio studio was for sound production, audio recordings were made in a recording booth located in the school’s Central Resource Centre.

To make Audio Studio (5.8.11): Select a mixing desk, a desktop computer and two or three pairs of headphones—Integrated Environments (5.4.1). Choose two or three ergonomic chairs suitable for long periods of seated activity and install the audio equipment on a workbench large enough for up to three children to work comfortably side-by-side, also include storage space for resources such as CDs—Task-specific Furniture (5.3.1), Dispersed Storage and Display (5.3.2). Create a physically enclosed space large enough for up to three children—Scale to Suit (5.6.1), Enclosed Spaces (5.6.7). Include a large window linking the audio studio to the neighbouring recording booth and position the workbench so the audio engineers can see the performers—Connected Views (5.6.5).
5.8.12 Recording Booth

‘Recording booths’ are settings for groups of children to perform and record speech, singing and musical performance.

The recording booth in the Wooranna Central Resource Centre, known as the Da Vinci Centre, was large enough for up to 10 children to stand together around a central microphone. Adjoining the recording booth was an audio studio for sound recording and audio engineering. The recording booth had a workbench with mixing desk, one desktop computer and enough space for two children. Large windows facilitated soundless communication between these two spaces, Figure 5.94.

**Figure 5.94 - Recording Booth**
Wooranna Central Resource Centre (Da Vinci Centre)

To make **Recording Booth** (5.8.12): Choose a microphone that can be lowered to child-height and three or four stacking chairs—Integrated Environments (5.4.1), Task-specific Furniture (5.3.1). Create a physically enclosed, soundproofed space large enough for up to 10 children standing close together, or a group of three or four children seated with musical instruments—Scale to Suit (5.6.1), Sound Barriers (5.6.6), Enclosed Spaces (5.6.7). Carpet the floor and clad the walls and ceiling with sound dampening material—Working Walls and Windows (5.5.1). Include a large window linking the recording booth to the neighbouring audio studio and position the microphone so that the performers can see the audio engineers—Connected Views (5.6.5).
5.8.13 Light and Shadow Lab

‘Light and shadow labs’ are settings for experimenting with light and projections.

In the mini-studio adjoining Vanessa’s Bialik Prep room was a table-mounted light box enclosed by a fabric canopy and curtain that children used to explore colour, shape and transparency, Figure 5.95. The darkroom in the Wooranna Prep neighbourhood was a small room without windows, located in the centre of the neighbourhood, Figure 5.96. Designed for a group of up to five children it had a central table-mounted light box with storage units at the side to house coloured gels, cellophane, torches, transparent and semi-transparent objects, and objects with interesting silhouettes. The large unobstructed space of the Wooranna Years 5/6 movement and performance space with moveable rostra, a large projection screen, a ceiling mounted data projector, blackout blinds and theatre lights was also equipped for light and shadow experiments, Figure 5.97.
5.8.14 Movement and Performance Space

‘Movement and performance spaces’ are settings for role-play, drama, dance and dressing up, Figure 5.98.

Wooranna’s Years 5/6 movement and performance space was a large room with prop and costume stores on the mezzanine level above the audio studio. Essentially an unobstructed space, it was furnished with six rostra, a low round table and an exercise bike, Figure 5.99. In both Prep neighbourhoods movement and performance spaces were furnished with small tables and chairs, and enclosed by T-screens and shelving units to create small role-play settings. Both neighbourhoods also had dedicated costume stores and puppet theatres, Figure 5.100.
TO MAKE MOVEMENT AND PERFORMANCE SPACE (5.8.14): Assemble a collection of props and costumes and store them on open shelves and clothes racks—Purposeful Tools, Resources, Objects and Artefacts (5.2.1), Dispersed Storage and Display (5.3.2). Select a large unobstructed space and organise the props and costumes so they are easily accessible without being in the way—Scale to Suit (5.6.1). In settings for older children include furniture such as rostra and mobile screens that children can move themselves to shape desirable performance environments—Task-specific Furniture (5.3.2). For younger children use shelving, screens and child-scale furniture to create a small collection of role-play settings within the larger movement and performance setting—Task-specific Furniture (5.3.2), Enclosed Spaces (5.6.7).

5.9 IDENTIFYING OTHER DESIGN PATTERNS IN THE CASE NEIGHBOURHOODS

In addition to the design patterns identified in the case neighbourhood interiors, the patterns of activity and behaviour exhibited by children and teachers in the case neighbourhoods indicate that there are other design patterns that warrant consideration.

Four speculative design patterns: ‘child caves for older children’, ‘places for teachers’, ‘homes’ and ‘neighbourhood assembly areas’ are presented here. The physical characteristics of each of these patterns were not specifically addressed in the Bialik and Wooranna case neighbourhood, but the activities and behaviours associated with them were observed in each neighbourhood. These patterns are speculative because it is unclear from this study whether such settings are desirable. They are included here to demonstrate how new design patterns might be considered and added to an expanding pattern language for school interiors.
5.9.1 Child Caves for Older Children

‘Child caves for older children’ are an extension of C. Alexander et al.’s (1977) design pattern for “child caves” (pp. 927-929). Child caves are small, enclosed spaces that belong exclusively to children because they have entrances too small for adults to enter (C. Alexander et al., 1977). The time-lapse sequences indicate that older children desired cave spaces, because in both Bialik Year 6 neighbourhood and the Wooranna Years 5/6 neighbourhood they constructed their own.

The Bialik and Wooranna Prep neighbourhoods included small cave-like spaces, but the Bialik Year 6 neighbourhood and Wooranna Years 5/6 neighbourhoods did not. In the Bialik Prep neighbourhood reading nooks were child caves, and in the Wooranna Prep neighbourhood the two child-scale levels of the reading loft functioned as child caves.

Wooranna Prep children also used the foam blocks in the large-scale construction setting to build child caves. This do-it-yourself approach was also evident in the cave spaces that Bialik Year 6 children and Wooranna Years 5/6 children built for themselves.

Wooranna Years 5/6 children appropriated the space beneath two trestle tables in the classroom workshop to create a cave space. The tables were introduced one afternoon for a maths information evening, and almost immediately children crawled into the space under the tables to read, Figure 5.101. Bialik Year 6 children in Judith’s home group transformed their established reading nook, Figure 5.102, into a cave space by adding a roof made from flattened cardboard boxes. The photographic data show that this cubby cave was frequented by groups of up to five children, including secondary school students who visited during lunch times when the Year 6 children were outside. Children in Joel’s Years 6 home group also created cave spaces, though theirs were temporary settings created by placing fat mats on the floor in ‘quiet corners’—behind the door, or in the centre of the room in small spaces enclosed by tables and chairs, Figure 5.103.
The cave spaces created by older children were all small and enclosed spaces in quiet corners—Enclosed Spaces (5.6.7), Quiet Corners (5.6.4). Two of their constructions also had low ceilings—Low Ceiling, High Ceiling (5.6.2). The most striking characteristic about these caves spaces is that they were all settings made by children for children. This may be significant and requires further investigation, because it is possible that cave spaces were attractive to older children because they created them.

TO MAKE CHILD CAVES FOR OLDER CHILDREN (5.9.1): Provide—Quiet Corners (5.6.4) and some customisable elements, such as cushions and sheets—Material Comfort (5.5.2) for older children to construct their own cave spaces.

5.9.2 Places for Teachers

Teachers’ comments and the photographic data indicate that within child-centred learning neighbourhoods teachers need dedicated places where they can conduct informal meetings, prepare teaching materials, and store personal belongings, resources and work samples.
In each case neighbourhood teachers conducted informal meetings near computers and close to the main circulation route, Figure 5.105. Wooranna Years 5/6 teachers comments indicate that a variety of storage (including plans presses, filing cabinets, open shelves and lockable drawers) is required to house teachers’ personal belongings, teaching materials and work samples. Wooranna teachers also expressed a need for somewhere to store personal equipment and belongings, such as pens and water bottles. Wooranna Prep teachers regularly stood, knelt or sat on the floor to work with children. They expressed
their frustration that the child-scale furniture in their neighbourhood did not meet their own physical needs. Teachers in the Bialik Year 6 and Wooranna Years 5/6 neighbourhoods knelt and sat on the floor also, but more often they stood, or sat on the child-scale furniture that was closer to adult size than the furniture for younger children in the Prep neighbourhoods.

**To make Places for Teachers (5.9.2):** Select casual, adult-scale furniture for informal meetings, ergonomic chairs, one or two computers and workstations, plus a large preparation surface with plans press and storage cupboards underneath—Task-specific Furniture (5.3.1), Integrated Environments (5.4.1), Dispersed Storage and Display (5.3.2). Use low, open shelving to create a sense of enclosure as well as maintaining visual transparency so that children can observe teachers modeling collaborative practice—Enclosed Spaces (5.6.7), Connected Views (5.6.5). Locate places for teachers close to the central circulation route—Location, Location (5.6.8), Circulation Routes (5.6.9).

5.9.3 Homes

The design pattern for ‘homes’ responds to the Wooranna Prep and Years 5/6 teachers’ routine practice of meeting with their home groups in areas described in this thesis as home bases. ‘Homes’ is also the name of a design pattern employed by the Medds at Eveline Lowe for settings used by a group of children and their teacher for pastoral care activities and by the whole learning community at other times (Medd & Medd, 1972). Although home bases were intentionally omitted from the plans for the Wooranna neighbourhoods the daily routines observed during the course of this research indicate that a design pattern for ‘homes’ warrants further consideration.

Two key considerations are indicated by the findings about home bases discussed in Chapter 4. Firstly, what kinds of activities home groups will use homes for, and secondly, how those activities relate to the activities home settings are designed to facilitate at other times.
At Bialik children spent the majority of each day working in their homeroom that belong exclusively to that home group. The Prep teachers and Year 6 teacher Judith each created an intimate home group meeting area in their homeroom that the group used for housekeeping, pastoral care, listening to stories and whole group discussions, Figure 5.106. Contrary to Wooranna’s pedagogical vision and Featherston’s interior designs, teachers organised their learning communities into home groups for housekeeping, pastoral care and learning reflection. Each home group adopted a setting within the neighbourhood as a ‘home’, but because these settings were designed for other purposes many were not suitable for home group activities, Figure 5.107. One possible solution is to develop a design pattern for ‘homes’ as settings that are used by home groups for short periods of time, but where the primary function is for other compatible activities such as role play, whole group discussion or recreational reading.

**FIGURE 5.107 - Home Bases in Neighbourhood Environments**
Wooranna Years 5/6 Neighbourhood (left), Wooranna Prep Neighbourhood (right)

**TO MAKE HOMES (5.9.3):** Create a display of children’s work on open shelves and use the shelves to partially enclose a space just big enough for eighteen children and one teacher to sit together in a circle on the floor—Dispersed Storage and Display (5.3.2), Scale to Suit (5.6.1), Enclosed Spaces (5.6.7). Do not include any furniture in this setting, but provide cushions to sit on and a place to store them when they are not in use—Material Comfort (5.5.2). Lower the ceiling to create an intimate setting—Low Ceiling, High Ceiling (5.6.2).
5.9.4 Neighbourhood Assembly Areas

‘Neighbourhood assembly areas’ are places large enough for the whole neighbourhood community to come together. These settings are for community announcements and presentations.

The Wooranna Years 5/6 community used their movement and performance space for community announcements. The Wooranna Prep community used their amphitheatre, which functioned reasonably well as a neighbourhood assembly area, although teachers would have liked a bit more room. Wooranna Prep children also used their amphitheatre as a whole group rehearsal space for singing, Figure 5.108. Bialik Prep and Year 6 teachers expressed the need for a space large enough to accommodate whole learning communities. The plaza space in the Prep neighbourhood could not be used because it was set up for other activities and the collaborative space in the Year 6 neighbourhood was too small. As with the design pattern for homes, the key question is how neighbourhood assembly areas might be used when they are not being used for neighbourhood activities. Also, the teachers’ comments suggest that they wanted to be able to use these spaces spontaneously, so any scene changing required to transform other learning setting into neighbourhood assembly areas needs to be quick and easy to do.

To make Neighbourhood Assembly Areas (5.9.4): Preserve an unobstructed space large enough for the whole learning community to come together for short periods of time. Or create a collection of temporary settings that can be quickly and easily moved aside for neighbourhood assemblies. Do not include furniture in this setting as these assemblies are brief, so children and teachers can stand—Scale to Suit (5.6.1), Task-specific Furniture (5.3.1).
5.10 FOUNDATIONS OF A PATTERN LANGUAGE

By working through the sequence of interior design patterns presented in this chapter, school communities in collaboration with design professionals ought to be able to determine what learning settings will best support the learning experiences that they want children and teachers to have. As well as which specific items are required in each setting under the categories: Loose Items (5.2), Furniture (5.3), Services, Facilities and Digital Technologies (5.4), Walls, Floors and Surfaces (5.5), Physical Characteristics and Spatial Organisation (5.6) and Lighting (5.7). They also ought to be able to determine the relationships between settings, which will indicate how the settings should be arranged. Specific environmental requirements, such as access to good natural light or a quiet place, will indicate where on the plan each setting should be located. Resolution of these considerations will determine the layout of the neighbourhood and the structure of the circulation routes required to link them together.

If the collection patterns presented in this chapter prove useful in helping designers and school communities to shape effective learning neighbourhoods, it may constitute the foundation of an interior design pattern language for primary school learning neighbourhoods. That is, the design patterns identified in the case neighbourhoods may be the beginning of a much more detailed understanding of the component parts of school interiors and how they contribute to learning experience. In *A Pattern Language* C. Alexander and his colleagues frame each design pattern with a philosophical discussion of human experience in either the natural or built environment. There is an equivalent need to locate the design patterns presented in this chapter within a discussion of school routines and day-to-day learning and teaching experiences so that they are more accessible to school communities and design professionals.

The next chapter *The Third Teacher* examines some of the design patterns presented in this chapter in greater detail. It investigates the pedagogical function of learning environments and how interior design is used to create meaningful learning settings that communicate their purpose to the children and teachers who use them. It interrogates the differences between the Bialik Prep neighbourhood and Wooranna Prep and Years 5/6 neighbourhoods that were designed by Featherston, and the one created by Bialik Year 6 teachers without any design assistance. This interrogation further explains the influence of interior design on children’s and teachers’ activities and behaviours. It also illuminates the little understood role of the interior designer working with school communities, and the shifting role that teachers are playing in managing, maintaining and enriching pedagogically stimulating school interiors.
6.1 THE PHYSICAL ENVIRONMENT AS THE THIRD TEACHER

In his exploration of the relationship between designers and the people who inhabit designed environments, architect Jonathan Hill (1998a, 1998b) provocatively suggests that users sometimes become ‘illegal architects’. He uses this suggestion to explore how users might contribute to the design of their own spaces and places. Hill’s use of ‘illegal’ indicates that there is something covert or at least undesirable about users designing their own environments. This chapter uses the concept of the physical environment as ‘the third teacher’ to argue that far from being undesirable, the involvement of users (particularly teachers) in the ongoing design of the neighbourhoods at Bialik and Wooranna was critical. It argues that teachers’ role as designers in the day-to-day management of their interiors was essential to whether or not those spaces communicated the potential of individual learning settings to children. It was also essential to how well the neighbourhood interiors conveyed the child-centred cultures of learning that Bialik and Wooranna were trying to promote.

Reggio’s sensorial, child-centred physical environments are often referred to as ‘the third teacher’ (Ceppi & Zini, 1998; Gandini, 1998). Strong-Wilson and Ellis (2007) explain that there are two reasons for this. The first is an acknowledgement that just as children learn from parents and teachers, who are their first and second teachers, they also learn from their physical environment. The second recognises the physical environment as one of three Reggio classroom educators, the other two are the teacher and the child.

Grounded in child development research, the architecture and interior design of Reggio Centres are material expressions of its child-centred philosophy - what Monahan (2002) refers to as ‘built pedagogy’. In the broadest sense, physical environments function as a teacher by providing behavioural cues for children and teachers (Featherston, 2002). School interiors are venues for displaying children’s work, documenting their learning processes and reinforcing desirable learning practices (Giudici & Rinaldi, 2001).
Learning environments can be designed and resourced to stimulate and provoke children’s curiosity and desire to learn (Millikan, May, 2007). They can also provide opportunities for children to learn about the world around them, such as the movement of the sun captured in the passage of a spot of light across the floor (Jackson, May, 2007).

This chapter examines how Featherston used design to create interiors intended to encourage and support experience-based learning and collaboration, as well as to promote, reflect and reinforce new cultural attitudes, behaviours and practices, including democratic and co-operative learning and teaching relationships and child-centredness. It looks at how Featherston used design elements to construct environmental cues and how susceptible those cues were to being re-moulded by children and teachers’ daily routines. This chapter also examines the ways in which the different teaching teams shaped, managed and modified their interiors in response to children’s needs or their own teaching purposes, and what influence those alterations had on the function of individual settings and whole neighbourhoods. This chapter will show the significance of the relationship between Featherston’s work and the design work done by teachers, and the transfer of responsibility for the neighbourhood interiors from designer to users. Equally significant was the support and encouragement teachers received from their colleagues and school leaders as they managing and resourced their spaces.

This chapter provides insights into the complexity of the education contexts at Bialik and Wooranna within which Featherston’s designed interiors were operating. It shows that interior design is part of a complex web of influences that shapes cultural change, and because of this inter-relationship it is difficult to isolate the influence of interior design. By looking at interior design in concert with other key influences, including pedagogical leadership and collegial support, this chapter describes some of the challenges and opportunities faced by teachers working in collaborative learning environments to develop new pedagogical practices. This discussion demonstrates the potential of interior design to support and promote the child-centred cultures Bialik and Wooranna were striving for. It also interrogates the ways in which the designed potential of the neighbourhood interiors was realised (or not) by different teaching teams.
6.2 DESIGNER SPACES AND TEACHERS AS DESIGNERS

What is apparent from studying the design of the case neighbourhoods, together with the teachers’ comments during the interviews, is that Featherston and the teachers each had design roles to play. Also apparent is that both these roles were required to exploit the potential of the neighbourhood interiors as the third teacher. Featherston’s role involved using the elements of interior design, including furniture design and selection, spatial organisation, and the use of colour, texture and light, to establish communication between the interior settings and the children and teachers who used them. The teachers’ role, as designers, was to build on Featherston’s communication by arranging furniture, and selecting and presenting tools, materials and learning provocations to develop a dialogue with children about learning. These roles describe an important partnership: Featherston designed the potential of the neighbourhood interiors as the third teacher and the teachers realised that potential by continually fine tuning the environmental communication to address children’s changing needs and their own pedagogical aims.

6.2.1 Designer Spaces - Wooranna Prep and Years 5/6 Neighbourhoods

Featherston’s designs for the Wooranna neighbourhoods demonstrate that even the smallest interior details, including how to store and display ephemeral loose items, contributed to the clear expression of the purpose and function of each learning setting. The Years 5/6 studio-lab, Figure 6.1 for example, was conceptualised as a hybrid art studio and science laboratory. The washable floor covering and sink suggest that it was a place for wet, messy activities. The combination of tall and standard height tables plus stools and easels indicate the range of activities done there. They also suggest the variety of working postures children might assume. The wire drying rack and the wide variety of tools and resources, including paint brushes, pencils, coloured paper, glue, assorted fabric and buttons, stored on the open shelves suggest that children’s activities include painting and model-making.

As well as communicating the purpose and function of the studio lab, those interior design elements were used to communicate abstract concepts about the culture of learning at Wooranna and the school community’s attitude towards children’s capabilities (Burke & Grosvenor, 2008). The arrangement of tables and stools into clusters indicates a culture of collaboration (Ornstein & Levine, 1989). Open shelving units and easily accessible tools and resources indicate that children are encouraged to be autonomous decision-makers (Betts, 1992), choosing for themselves which tools and materials are appropriate to their task (Gardner, 2006). Good natural light for tasks such as mixing paint colours and making detailed measurements communicate respect for children’s work, especially as White (2005) suggests, their visual art.
Some learning settings in the Wooranna case neighbourhoods communicated their purpose through environmental cues borrowed from other cultural contexts. The Years 5/6 movement and performance space, Figure 6.2 for example, uses the visual language of black box theatre to articulate its function. Dark coloured walls and ceiling, blackout blinds covering the windows and theatre lamps hung from the ceiling truss beams are all part of a familiar visual language of theatre spaces that Featherston used to shape children’s and teachers’ expectations of how this setting would function. Featherston introduced these environmental cues to stimulate associative links with users’ previous experience of theatre spaces - enough to persuade them that this setting was a place for dramatic exploration, movement and performance, even if their previous experience of theatre was indirectly via film or television.

The previous example illustrates the power of colour and light to evoke a theatre. Other interior design elements such as texture, material and form can be used in equally evocative ways. The curved leather-like red vinyl couch and round table in the Years 5/6 lounge, Figure 6.3 for example, evoke associations with sofas and coffee tables in other contexts and cast this setting as a domestic space for recreation and social interaction. Despite the unusual shape of the couch, the familiarity of its upholstered form encouraged children to adopt more relaxed, leisurely postures than they did when sitting and working at tables. Likewise, the 25 tablet chairs in the Years 5/6 classroom workshop, Figure 6.4, were familiar reminders of the functional and behavioural norms of conventional classroom spaces. Their upright form and compact work surface echo traditional classroom tables and chairs, and those associations are transferred onto the tablet chair. However their pale green colour distinguishes them from more institutional classroom furniture and, as discussed in Chapter 2, their form also speaks of flexibility and choice because it permits so many different arrangements and configurations.
In the more open-plan environment of the Wooranna Prep neighbourhood, pronounced localised changes in ambience were used to communicate specific messages to elicit specific behavioural responses (Thiel, 1997). The fabric sail pictured on the left in Figure 6.5, for example, was a design prototype being tested as a strategy to create more enclosed venues for dramatic play. As the photo on the right shows, sunlight passing through the orange bemsilk sail was warm and diffused in contrast to the bright white light in the rest of the neighbourhood. The fabric sail created a tranquil, shady ambience in the three or four settings beneath it which, according to the Prep teachers, encouraged children to calmly engage in dramatic play. Teacher Carmel observed that the fabric sail altered how children used the spaces and the volume at which they spoke, which she claimed significantly reduced the noise levels in those settings.

It is likely that the reduction in noise levels that Carmel observed resulted from the combined influence of several design elements including the scale of the settings, the
degree of enclosure, ceiling height and ambience. The small size of the dramatic play settings meant that no more than two, possibly three, children could work together comfortably, and their close proximity to one another meant they did not need to speak loudly to be heard. Also Featherston’s T-screens and play-screens that were used to define the dramatic play settings created a visual barrier to the rest of the neighbourhood, which according to Lippman (2004a), is likely to have focused children’s activities inside the dramatic play settings. Finally, the fabric sail lowered the ceiling height and created a warm, restful ambience, making the settings below feel more enclosed and intimate, as in C. Alexander et al.’s (1977) design pattern for ‘child caves’. Together these environmental cues signaled to children that the appropriate behaviour in these settings was quiet collaboration.

The Wooranna case neighbourhoods designed by Featherston demonstrate how interior design elements can be used to create interior environments that respond to the needs of children and teachers. The Wooranna interiors also demonstrate how interior design expertise can be used to communicate the purpose and function of individual learning settings as well as the over-arching values of a school. The capacity of interior design elements to carry and convey meaning to users, and the designer’s skill in investing cultural, social and aesthetic value in architectural interiors, are pivotal to the concept of the physical environment as the third teacher. The Bialik Prep homerooms provide further evidence of the idea that design can communicate to children and teachers possibilities and opportunities for investigation and discovery. They also demonstrate how teachers can manipulate and mould environments with subtle shifts, such as the arrangement of stools or the display of books.

6.2.2 Modular Spaces - Bialik Prep Neighbourhood

The furniture system Featherston designed for Bialik’s ELC enabled teachers to organise their homerooms into multiple learning settings using modular components. The Prep teachers’ descriptions of their own spatial organisational strategies reflect their conscious engagement in shaping their homeroom settings as sources of inspiration for children. With the aid of a floor plan each Prep teacher decided what learning settings she needed and how to arrange them so that children could move between them easily. The spatial organisation of each homeroom reflected the teacher’s individual teaching style and showed their individual approach to recruiting the interior environment in their pedagogical practice. Prep teacher Vanessa created discrete and enclosed settings with small and intriguing displays to lure children’s interest, whereas her colleagues Dawn and Sophie created more open and transparent environments with less overt boundaries between settings.
Vanessa’s floor plan Figure 6.6, shows how she arranged her furniture to create six settings for computing, communication, whole group discussion, maths problem solving, reading and relaxation, and small group discussion. She needed to determine the size of each setting, how open or enclosed it was, its relationship to the other settings, and its location within the homeroom space, all of which contributed to the environmental cues that communicated the function of each setting. For example, the number of stools or chairs in each setting indicated the maximum number of children who could work there at one time, and the arrangement of seats (back-to-back or facing each other) suggested what kinds of working relationships children might have and their activities. Stools positioned facing each other suggests an oppositional interaction, such as playing a language game Figure 6.7, where each player must shield their answers from view by their opponent, while the orientation of chairs in Figure 6.8 indicates that computing is a solo activity.
Among the angular efficiency and simple clean lines of the modular storage units and laminated work surfaces are pieces of freestanding furniture that are distinctive because of their contrasting form and materials. The child-scale couches in Vanessa’s room, Figure 6.9, were upholstered in deep green corduroy fabric. Their distinctive colour, texture and shape cast them as domestic and homely, indicative of comfort and rest (Burke & Grosvenor, 2008; McKellar & Sparke, 2004), suggesting that children’s mode of work in the lounge was informal, social and perhaps connected to leisure. Vanessa introduced a portable CD player and four sets of headphones into the lounge setting and she created a book display close by. These things express the function of the lounge as a place for reading, listening to stories, rest and relaxation.

The only other disruption to the rectangular forms of the modular furniture was a round table used for small group discussions, Figure 6.10. The clean MDF surface of the table matches the other surfaces in the Prep homerooms, but its shape signals a different mode of work and a different working relationship. Featherston used the circular table to promote interaction and group discussion between up to five children by directing their attention towards the centre of the table and each other. Although children used this setting for activities other than group discussion, there were no tools or materials that might suggest what those other activities were, which was unlike the majority of settings in the Prep homerooms where loose items were used to qualify their purpose. The communication setting, which was used for literacy activities, housed children’s writing journals and shelves filled with sheets of coloured paper, pens, pencils, rulers and word games. In the maths problem-solving setting, the shelves housed number games, dice, calculators and playing cards. These collections of tools and materials communicated to children what the setting was for and what activities they might like to do there.
The functional potential of Featherston’s furniture system to shape spatial environments and carry tools and materials was realised and developed further by Vanessa’s spatial organisation, and the dialogue she established with children through her selection and presentations of tools and materials specific to each of the learning settings she created. This implies an informal partnership between designer and user, where the user becomes a designer customising places and spaces by filling them with material objects that qualify the purpose of the setting, and communicate to children what activities and behaviours are appropriate to each setting and to a culture of hands-on learning investigation. In this way the tools and resources that teachers selected and presented on open shelves were an advertisement or invitation to children to draw, invent and play. They also expressed an image of children as independent decision makers.

6.2.3 Teacher Designed Spaces - Bialik Year 6 Neighbourhood

Without the assistance of a designer and with limited resources, Bialik Year 6 teachers Judith, Aaron and Joel reclaimed what they described as the ‘wasted’ circulation space of the corridor outside their homerooms and transformed it into a collaborative, autonomous learning environment for Year 6 children. They faced a significant design challenge to maintain a clear 1.5m passageway while creating a functional learning environment within the 3.4m wide corridor space. They arranged five single tables, 15 chairs, one larger table and a small mobile whiteboard against the walls on either side of the corridor, Figure 6.11. A wall-mounted display that was part of a learning investigation, select examples of children’s paintings and collages, and a maths problem wall, were the only clues to indicate how the space might be used or what activities usually took place there.
The Year 6 teachers wanted children to develop skills for working independently and to use the collaborative space for specialist activities such as painting and model making. These behaviours resemble the kinds of independent, exploratory and collaborative behaviours Moore (1986) observed in young children working in well-defined learning settings, as discussed in Chapter 1. Despite the teachers’ efforts, the environment they created exemplified three of the four characteristics that Moore uses to identify poorly defined learning settings. Firstly, the spatial organisation and furniture arrangement did not clearly define the boundaries of each setting. Secondly, the furniture types were not task-specific and thus did not help to distinguish one setting from another or suggest particular activities. Nor did they provide storage space. Finally the settings were poorly resourced, so the behavioural cues that might have been provided by tools and materials were absent.

Figure 6.9 shows that teachers arranged the furniture to create three settings within pockets of space on either side of the corridor. However, as Figure 6.12 illustrates, there was little to identify those settings as anything other than venues for table-based activities. Instead the environmental cues of the corridor characterise the collaborative space as an extension of the homeroom spaces, Figure 6.13. The corridor was longer and narrower than the homerooms but the ceiling height, wall and floor coverings, paint colours, and furniture types were the same. There was a subtle difference between the ambience of the homerooms and the corridor. Both were lit with fluorescent strip lighting, but the natural light coming through the windows in the homerooms made them lighter and less subdued than the corridor space.

During the period of photographic observations in the Bialik Year 6 neighbourhood, each home group was investigating an aspect of the human body. Joel’s group was debating the comparative merits of the human circulatory and respiratory systems.
Aaron’s group was using PowerPoint presentations to examine organ functions, and Judith’s group had just dismantled a large display of x-ray films suspended from the ceiling in their homeroom. All Year 6 children were also making small papier-mâché models of human skeletons, Figure 6.13, and contributing questions and responses about health, disease and body function to a life-size human silhouette on display in the collaborative space, Figure 6.14. The forest of post-it notes documented the children’s collaborative efforts, as a learning community, to question how the human body works. The human silhouette was the strongest material expression of the collaborative learning culture that Year 6 teachers were trying to foster.

Children were observed using the collaborative space in the same ways that they used the classrooms, which appeared to reinforce the corridor as an extension of the homeroom spaces and learning culture. When Aaron’s home group was working on their papier-mâché skeletons, for example, they collected their models and the materials they needed from their homeroom then, in small groups of three or four, they distributed themselves throughout their homeroom and the collaborative corridor space. Some children worked sitting at tables, others chose to stand, but there was no difference between the activities, postures, or behaviours of the children working in the classrooms compared to those of the children working in the collaborative space. Arguably this was because they were all engaged in the same learning activity, however it may also have been because there were no environmental cues to signal that alternative behaviours, postures or activities were appropriate or desirable.
Altering the environmental cues in the corridor space may have been an effective way of communicating to children which alternative modes of learning and different forms of expression were desirable. For example, had there been some standing height benches in the collaborative space, the children’s standing postures may have been supported and encouraged. If a variety of model-making materials had been available, children may have used a wider variety of expressive languages, including clay moulding, balsa wood construction, and fibre weaving to create their skeletons. Different materials may also have suggested collaborative possibilities, such as a group of three children working together to build a sub-structure from wire and then covering it with paper or fabric. Instead all the children were individually engaged in the same task at the same time using the same materials.

6.2.4 The Link Between Design Patterns and Environmental Cues

Symptomatic of the poorly defined settings in the Bialik Year 6 collaborative space was the lack of resources - there was nowhere to keep the things that children might need, such as newspaper, glue and masking tape. For example there were no specific resources or equipment to define or communicate the purpose of the maths studio setting other than worksheet folders pinned to the wall. Neither were there any blank post-it notes or pens to encourage children to add to or modify their questions and responses on the human silhouette. This is where the design pattern Purposeful Tools, Materials, Resources, Objects and Artefacts (5.2.1) may have been useful to articulate what activities each setting was for. If maths puzzles, painting materials, books, magazines and model-making equipment had been available in the collaborative space, children may have chosen to work there rather than in their homerooms where those materials were not available.
The teachers’ intention behind creating the large work surface in the corridor was to encourage children to work together on large-scale art and model-making projects. However the time-lapse sequences showed more children working on their own in the company of others, and fewer children working together than expected. The group sizes were also smaller than expected. Rather than groups of four or five children working together, pairs of children tended to collaborate at the two accessible corners of the large work surface as indicated by the blue dots in Figure 6.15. A likely explanation is that children were working individually on the same task, but environmental behaviour research suggests another contributing factor may have been at play. Hall (1966) describes research conducted in a hospital geriatric ward that found interactions were twice as likely between people across the corner of a table as they were between people seated side-by-side, and three times as likely as interactions between people seated opposite one another. This suggests that a smaller table, accessible from all sides, like the one shown in Figure 6.16, may have encouraged more collaborative behaviour.

![Figure 6.16 - Alternative Standing Height Table](image)

**Figure 6.16 - Alternative Standing Height Table**

Bialik Year 6 Neighbourhood, Collaborative Learning Space

Another design pattern that may help to better define individual settings within the collaborative space is *Dispersed Storage and Display (5.3.2).* There was nowhere to store materials or display three dimensional work, so ongoing investigations like the human skeleton explorations were packed up at the end of each session and stored on top of the lockers in the homerooms. As a result children had fewer opportunities to see and be inspired by each other’s work. The inclusion of storage shelves, screens and display cases...
may also have helped define individual settings and shelter them from through traffic. It is possible that more overt environmental cues communicated via the arrangement of task-specific furniture and displays of children’s work would have more effectively defined the corridor as a Year 6 learning area the posters put up by the Year 6 teachers. These environmental cues may also have encouraged other staff and students to use the space respectfully. Figure 6.17 illustrates an imagined redesign of the corridor space using the patterns for *Purposeful Tools, Materials, Resources, Objects and Artefacts* (5.2.1), *Task-specific Furniture* (5.3.1), and *Dispersed Storage and Display* (5.3.2).

![Figure 6.17 - Alternative Spatial Organisation](image)

Bialik Year 6 Neighbourhood, Collaborative Learning Space

### 6.3 FLEXIBILITY AND PERMANENCE

The interiors of the Bialik and Wooranna case neighbourhoods occupy an interesting position in the debate about flexibility in school design. They prompt questions about the degree to which purposefully designed learning environments should also be flexible, and what an effective balance between purposeful and permissive design might be. As discussed in Chapter 1, flexibility is a highly contested term meaning different things to different people. In relation to the case neighbourhoods flexibility equated to responsiveness. It meant finding the opportunities that existed within designed environments for fine-tuning spaces and places so that they responded in a detailed way to the particular needs of a specific learning community at any given point in time.
Featherston’s (2009) claim “that permanent settings save time and energy which would otherwise be spent in negotiating and scene shifting” (p. 121) was endorsed by Wooranna Years 5/6 teacher Christine’s comments that the design of their neighbourhood gave her choice and supported her teaching practice. She said:

I know when I go into the target teaching area, I can work with certain students on certain needs; and if it’s the computer area, I’m there for research. If I’m around the red couch, I’m looking at a book with another student or whatever it be. I know what the areas are used for and I access them.

And that gives me freedom.

However, the Years 5/6 teachers also characterised their neighbourhood design as permanent and inflexible, and saw themselves as having little agency or scope to change it. This tension between purposeful design and permissive environments is captured in Perkins’ (1986) reflection on his design for Crow Island that “uncommitted permissive space is more valuable than over-designed specific space” (p. 63). The qualifier ‘over-designed’ is significant here, because there is also danger in under-designing school interiors in the name of flexibility, which is of concern in relation to the largely open plan spaces that are a feature of Victoria’s new BER buildings.

The time-lapse sequences and interviews with Wooranna teachers suggest a difference between Featherston’s concept of ‘flexibility’ and how it was perceived and experienced by teachers. Figure 6.18 illustrates Featherston’s (2009) concept of learning environments consisting of three layers that vary in degrees of permanence. The first layer, the building is fixed and permanent, the second layer, the fixtures and furnishings is semi-permanent, and the third layer, the loose items is highly changeable and impermanent. The plan and elevation drawings on the left in Figure 6.19 illustrate the Years 5/6 studio-lab according to Featherston’s three layers concept. The furniture illustrated in blue was semi-permanent, but the loose items illustrated in green are highly changeable. The plan and elevation drawings on the right in Figure 6.19 show the same setting from the users’ perspective. The time-lapse sequences showed that built-in furniture, storage and tables holding
computer equipment (indicated in red) were not moved and should perhaps be considered fixed. The tables and chairs shown in green were reconfigured for different activities and therefore may be considered as changeable items. Only the large storage units on castors (indicated in blue) were truly semi-permanent.

![Figure 6.19 - Degrees of Permanence](image)

Wooranna Years 5/6 Neighbourhood - Studio Lab
The designer’s perception of degrees of permanence (left). The users’ perception (right)

Interestingly Bialik Prep teachers who were free to determine and change the spatial organisation of their homerooms decided the layout of their room at the beginning of the school year and stuck to it. Having arranged the furniture to support her own pedagogical practice, each teacher selected and presented tools, materials and resources to fine-tune the purpose of each setting. The teachers’ interview comments suggest there was inherent value for them in designing their homeroom spaces. Being responsible for the spatial organisation, furniture arrangement and selection of loose items appeared
to heightened their awareness of the potential of their homeroom settings to influence children’s learning experiences. In particular their selection and curation of loose items for each setting responded closely to children’s changing needs and interests.

6.4 USERS RESHAPING ENVIRONMENTAL CUES

Environmental cues are malleable meaning the spaces where children and teachers work can be highly responsive to the changing needs of users, especially if teachers understand how to exploit them to achieve their pedagogical aims. However, the malleability of those cues also makes them vulnerable to deterioration and reinterpretation in ways contrary to the intention of their design. The ways that children and teachers at Wooranna used and inhabited their neighbourhoods influenced the environmental cues of learning settings - sometimes positively - sometimes negatively, and sometimes overriding them altogether. Because the environmental cues were not fixed they were subject to manipulation and change caused by use and habitation. Hall (1966) explains that this shaping and reshaping of spaces is the result of the cultural practices and daily routines of the people who live and work in them.

6.4.1 Inadvertent Communication and Unintended Consequences

One example the subtlety and power of environmental cues can be came to light during the interview with the Wooranna Years 5/6 teachers. Teacher Christine cited an example of a former Years 5/6 teacher who personalised her home group meeting area by displaying photos of her home group members on the walls. Her home base was in the upstairs quiet study, a learning setting designed to be used by all the members of the Years 5/6 learning community. The home group teacher’s aim in pinning up the photos had been to foster a sense of belonging for the members of her home group, which Carter (2006) suggests is important for children’s and adolescents’ sense of self and wellbeing. The unintended consequence was that the photos functioned as a powerful environmental cue that the quiet study was an exclusive space and children not in the nominated home group should, as Christine put it, “keep out”.

This example highlights a very real challenge faced by teachers who are working in large collaborative learning neighbourhoods, trying to balance the individual needs of children for safety and security with the needs of the whole learning community. It also highlights the power of physical and material environments to communicate with the people who use and inhabit them, and the ease with which unintended meanings can be communicated. Most importantly for this research, it highlights the enormous potential of interior design to direct and influence children’s learning experience, and the corresponding potential that teachers have to communicate with children by managing and manipulating the clues, signals and prompts woven into the fabric of their interiors.
6.4.2 School Routines Overriding Environmental Cues

Every detail of Featherston’s design for the Wooranna Years 5/6 neighbourhood helped signal the purpose of each place and space - her use of colour, texture and form, her manipulation of light and shade, and her design, selection and arrangement of furniture. However the time-lapse sequences indicate that the environmental communication designed by Featherston had less influence on how children and teachers used individual settings than their routine activities and behaviours in those venues. The most striking example was revealed when the patterns of activity and behaviour plotted from the time-lapse sequences, which corresponded to teacher-led home group study periods, were compared to those plotted from the sequences during learning agreement periods when children were working on self-directed projects. This comparison indicated that routine behaviours were capable of overriding the cues for activity and behaviour embedded in the interior design.

FIGURE 6.20 - Home Base Locations
Wooranna Years 5/6 Neighbourhood
The pink dots on the floor plan in Figure 6.20 show the home group meeting areas established by teachers Rachel, Jay, Christine and David in the games and construction setting, the movement and performance space, the studio lab, the quiet study upstairs, and the classroom workshop. The teachers’ intention for the home group meeting areas was to provide secure places for children to build their confidence as members of a large neighbourhood community with the social support of their home group. This aim is supported in literature (DEECD, 2009c, 2009h; Nair & Fielding, 2005), which suggests that “home bases provide safety, security and a sense of belonging” (DEECD, 2009l, p. 12). But it was not the informal pastoral care-type home group meetings at the beginning and end of each day that appeared to be the problem - it was the formal time-tabled home group study periods.

The Years 5/6 teachers had inserted home group study sessions into Wooranna’s otherwise child-centred education program and integrated curriculum. Conducted four times weekly, these periods of conventional teacher-centred instruction focused on children’s core competencies in literacy and numeracy. According to the teachers this was in response to poorer than expected results on external testing conducted under Australia’s newly introduced National Assessment Program - Literacy and Numeracy (NAPLAN) and the subsequent introduction of lead tables published by the Australian Curriculum Assessment and Reporting Authority on the My School website (ACARA, 2010). Assistant Principal Louise claimed that these sessions were also about teachers’ control, whereas Principal Bryan explained that teachers had “started to drill the kids again”.

For this research, the reimposition of table-based reading and writing activities during home group study periods was significant because they conflicted with the intended use of the settings where the study sessions were held. More significantly though, the way those settings were used during study periods appeared to have encouraged children to pursue table-based reading and writing activities during learning agreement time, which appeared to discourage children from pursuing the kinds of activities the settings had been designed for. This meant that, both pedagogically and spatially, home group study activities were in conflict with the design intent of the Years 5/6 learning neighbourhood as a venue for child-led investigations and experiments.
During learning agreement periods Years 5/6 children were free to choose the work mode to suit their learning goals, yet the time-lapse sequences showed that at those times almost all children were reading and writing. As the scenes in Figure 6.21 illustrate, this pattern of activity was all pervasive, including the games and construction setting and the movement and performance space, which were not furnished for table-based activities. Barker (1968) and Thiel (1997) suggest that the action played out in a particular scene or context is itself a powerful cue for what behaviours are appropriate to that place, powerful enough to discourage alternative behaviours. It is possible therefore that children’s routine study behaviours overrode the design cues of these settings by discouraging alternative, and more desirable, learning activities. The most pertinent example of this was the episode detailed in Chapter 4 when three children carrying a portable stereo entered the movement and performance space and left again less than three minutes later. What prompted them to leave is not known, but the behaviour cues of the other children reading and writing in that setting seems a likely explanation.
Interestingly, the two Prep learning communities also used particular learning settings in their neighbourhoods for home group activities, but unlike Wooranna’s Years 5/6 neighbourhood these routine activities did not appear to influence children’s patterns of activity during negotiated learning periods. The photographic data and time-lapse sequences showed that Prep children used each setting for its designed purpose during child-led sessions, which suggests that their home group activities did not overwhelm the environmental cues. A couple of factors may explain this. Prep home group activities were frequent informal discussions of less than 30 minutes, generally at the end of each learning period when children sat on the floor to share their learning reflections. In the Wooranna Prep neighbourhood, group meetings did not contradict the designed purpose of the amphitheatre and the maths problem-solving and large-scale construction settings where they were held, because children usually sat on the floor there. At Bialik, Prep home group meetings were held in the home group meeting areas on the large carpet mats that Featherston selected especially for group meetings and learning reflection.

When asked about the prevalence of study activities observed during learning agreement time in the Wooranna Years 5/6 neighbourhood, the teachers suggested that children were doing research for their history investigation. All the children were gathering facts about their particular period in history to develop a narrative they would animate using 3D computer software. This was a response to a push from Principal Bryan to embrace digital technologies. Christine said, “In the past, not everyone would have done an animated film as their end result. In the past, people would have done different things; they could have done painting or...”. Rachel suggested that the other reason that they had chosen a single mode of expression was so “we’d have something that the unit could own as a whole rather than all the little separate bits that we did at the beginning of the year”. Assistant Principal Louise recalled discussing the teachers’ plans for this project and warning them “you are going to have issues with the physical environment if this is the way you go down with this project, because everybody’s doing the same thing”.

Louise’s comment highlights the contradiction between the way that Years 5/6 children and teachers used their learning environment, and the intent of its design. It also points to worrying changes in teachers’ pedagogical practice (confirmed by their own comments) that were at odds with Wooranna’s vision and the design of its interiors. This appears to have been a result of inconsistent pedagogical leadership caused by the breakdown of Bryan and Louise’s close working relationship, which coincided with this research. Prior to 2007 Louise had been Head of Learning and Teaching. Her role was to mentor the teaching teams and under her guidance Wooranna enjoyed its highest level of academic achievement. At the time of this study Louise was responsible for reviewing Wooranna’s
national assessment data and assisting teachers to develop strategies to improve the results of children deemed ‘at risk’ across the school. Ironically these interventions Louise was helping teachers make, undermined the integrated curriculum that she and Bryan had worked so hard to develop.

This shift within the leadership structure at Wooranna, and its apparent influence on teaching practice, illustrates the complexity of the context within which the interiors Featherston designed were operating. Louise claimed that the Years 5/6 neighbourhood functioned well for two years after the refurbishment. During that period she was still providing the teachers with direct pedagogical guidance and Featherston continued to assist them to develop the resources in each setting. The teaching team this research observed working in the Years 5/6 neighbourhood included two teachers who were part of the *Inside-Out Project*. The others had been teaching in the space for two years or less. The combined effects of new staff, a change in leadership structure, the conclusion of Featherston’s direct involvement, and a return to more conventional teaching practices make it difficult to isolate the influence of interior design on cultural change. Therefore interior design must be considered as part of a complex network of influences that operate in concert to shape the culture of learning.

### 6.4.3 Exploiting the Third Teacher

Wooranna Prep teachers Carmel, Kate and Natasha used their target teaching setting in many and varied ways, introducing loose items such as cooking utensils, painting materials, and books to communicate the focus of particular investigations. This small enclosed setting, shown in Figure 6.22, had a long bench at one end with storage shelves and cupboards underneath and a rectangular table with six timber stools in the middle, to accommodate a small group of children working with one adult. It was commonly used for skill development such as guided reading. The teachers also transformed it for
other activities by pushing the table and chairs to one side to create space for a dramatic exploration. They also replaced the furniture with two easels, and set out paints, brushes and other equipment for painting activities on the shelves. Their most extensive alterations were for *Our Melting Pot*, an investigation of culture through food and the sensory relationship between smell and memory (Wooranna Park Primary School, 2007).

The *Melting Pot* investigation ran over the course of one term and used food as a portal into broader considerations of ethnicity, culture, difference and similarity. Cooking aromas were used to evoke feelings and memories, and children’s sense of smell was the stimulus for their investigations. The teachers introduced portable electrical cooking appliances including a rice cooker, an electric frying pan and a microwave oven into the setting and filled the shelves and cupboards with recipe books, cooking utensils and food ingredients to create an immersive context for the children’s investigation. With these objects and foodstuffs, teachers introduced new environmental cues signaling alternative modes of work, including weighing and measuring ingredients and tasting food. This episodic reshaping of the target teaching space illustrates the different ways that teachers used loose items and furniture to create different contexts for learning experience in the same space over time - described by American academic Janice Bissell (2004) as teachers’ construction and use of space to support teaching practice.

### 6.4.4 Working Around Environmental Cues

Wooranna Prep teachers also developed strategies to work around environmental cues in other settings to adapt them for alternative purposes. This was most evident in the amphitheatre, which was one of three settings that teachers used as home group meeting areas. The environmental cues manifest in the tiered seating, the semi-circular surround of the amphitheatre, and the overhead data projector were designed to direct children’s attention towards the wall-mounted electronic whiteboard. Kate explained that when the whiteboard was in use the setting worked well because the functional purpose of the tiered seating was clear. However she said she found it difficult to conduct group discussions in the amphitheatre. She explained that the tiered seating prevented children from sitting in a circle, and because they were not facing one another and could not see each other they were inclined to fidget and be distracted.
Both the interviews and the time lapse data indicate that sometimes teachers needed to develop strategies to manipulate and adapt less flexible settings (like the amphitheatre) to suit particular pursuits, such as a whole group learning reflections. Prep teacher Carmel did this by working around the cues manifest in the amphitheatre’s design. She organised her home group to sit in a staggered horseshoe configuration across the curved, tiered amphitheatre steps, and placing herself at the opening of the horseshoe she completed a rough circle, Figure 6.23. Using this strategy, she was able to direct children to use the amphitheatre in a slightly different way so that they could see one another while they shared their ideas. According to Carmel, when children sat in the horseshoe configuration they were also less inclined to be distracted. Carmel’s use of the amphitheatre is a useful illustration of how user experiences of school interiors might be useful in informing the future development and refinement of design patterns for school interiors. It also demonstrates teachers’ role as designers.

6.4.5 Disrupting Designed Purpose

As shown by Wooranna Years 5/6 teacher Christine’s story of one teacher’s conversion of the quiet study into a personalised home group meeting area, alterations to the material environment can have unintended consequences for environmental communication. Another episode documented in the Wooranna Prep neighbourhood showed that, unless carefully planned, the introduction of new technologies can also have unintended and far reaching consequences. The introduction of a Nintendo Wii games console and wide screen TV monitor into the darkroom setting meant that the preexisting light box technology could no longer be used and therefore the designed purpose of the darkroom was lost. The teachers’ comments suggest that the Wii was imposed as part of Bryan’s technology push and not considered carefully enough, either in terms of its relationship to the Prep curriculum or the function of the neighbourhood as an integrated network of purposefully designed venues for learning.
Prior to the introduction of the Wii the darkroom was a place for creative exploration with light. Children had access to a variety of materials including coloured gels, cellophane, torches, transparent and semi transparent objects, and objects with interesting silhouettes to explore using the table-mounted light box, which were all located in the original darkroom space indicated by ‘A’ on the plan in Figure 6.24. The TV monitor and the Wii console did not require a blackout space, instead the darkroom was selected because it was an enclosed space that would limit possible distraction caused by the Wii. Introduction of the Wii meant the darkroom was no longer dark and there was no longer enough room for the light box or the exploration materials, so the light box was moved out and the darkroom became a venue for digital interactive games.

Without the designed environment of the darkroom, the light box functioned poorly. First it was moved to a light-filled corner of the communication setting, at ‘B’ in Figure 6.18, where it could not be used because the surroundings were too bright. Then it was moved into a corner of the large-scale construction setting at ‘C’, where Carmel created a makeshift darkroom by covering some of the windows with black paper and enclosing a small area with dark fabric. Here the light box was operational, but the makeshift darkroom was less effective and less stable. It also had a negative impact on the large-scale construction setting because there was less space available for children’s constructions and they had to modify their building activities to avoid knocking down the darkroom structure.
The frustration expressed by the Prep teachers about the introduction of the Wii suggests that due consideration was not given to its potential impact on the learning neighbourhood and on learning and teaching practices. In isolation the decision to use the darkroom setting makes sense, but considered in the context of the whole learning neighbourhood and the unintended consequences it brought, it does not. Carmel’s attempts to reconstruct the darkroom elsewhere powerfully demonstrate the functional qualities of the original darkroom as a dark enclosed setting. The makeshift darkroom and its imposition on the large-scale construction setting, Figure 6.25, also highlights the significance of the physical learning environment as a total system, vulnerable to disruption.

In the Bialik Prep neighbourhood new technologies were equally significant, and the Prep teachers cited them as a primary consideration when planning the spatial organisation of their homeroom environments. Special consideration was given to the location of digital technologies, each of which had specific requirements that had to be accommodated within the available space and with access to power points. Prep teacher Vanessa explained that she located the electronic whiteboard in her room next to the window where there was sufficient wall space. This in turn determined the location of the home group meeting area because she wanted to use the electronic whiteboard during group discussions. All the Bialik Prep teachers located desktop computers close to power points and away from direct light as much as possible. They also used the blinds to adjust natural light levels when required to suit electronic screens. Their opinion was that portable digital technologies such as laptop computers and wireless keyboards would offer greater choice and flexibility for children and teachers within their learning environment.
6.5 FROM INTERIOR DESIGNER TO SCHOOL COMMUNITY

The data plotted from the time-lapse sequences, the teachers’ comments during the interviews, and the visual analyses of the four case neighbourhoods indicate the importance of the neighbourhood interiors as venues for experience-based learning. However these data also demonstrate that those spaces became less supportive when school communities, particularly teachers, were not attuned to the influence of the physical context on learning and teaching. This points to the significance of the designer’s task to construct clearly articulated and functional interiors, and the equally important role teachers played in managing and continuing to develop these spaces to suit their own practices and the changing needs of children. It also suggests that how these roles were executed plus how the transfer of responsibility from designer to school community was managed, influenced the effectiveness of the neighbourhood interiors as sources of support and inspiration for children’s learning investigations. Having developed neighbourhood environments, it appears that the team teaching structures, leadership styles and collegial relationships at Bialik and at Wooranna also influenced the ways that teachers constructed, manipulated and used their learning spaces.

6.5.1 Transferring Responsibility

Featherston’s design collaboration with the Bialik ELC community was for a discrete period, and once the furniture system was installed teachers assumed responsibility for constructing their learning environments, as was their former practice. Initially they struggled to use the modular system despite the spatial organisation guides Featherston produced. Her assessment was that sustained interest in the ELC learning environments encouraged teachers to persevere with their spatial experiments. The Prep teachers’ comments indicate that through perseverance and experimentation they developed an awareness of how their room layouts supported children’s activities and the skills to shape their spaces effectively. Their practice of critiquing each other’s room layouts appears to have been an important factor in this process.

At Wooranna the Inside-Out Project attracted significant professional interest from educators and designers and stimulated a constant flow of visitors to the school. The Years 5/6 neighbourhood was regarded as a pedagogical exemplar and a design prototype, which put significant pressure on the teachers and on Featherston to make it work. It appears that because of this the teachers did not have the same opportunity to experiment and learn from mistakes that the Bialik Prep teachers had. Featherston continued to work with teachers helping them to resource each setting, and it appears that because of her ongoing involvement teachers did not assume full responsibility for managing their interiors. Consequently the Years 5/6 teachers did not develop the
environmental skills that Lackney (2008) suggests teachers need to manage their physical environment effectively. Featherston also assisted the Wooranna Prep teachers to develop and resource their learning settings but for a shorter period of time, which meant that the Prep teachers assumed responsibility for their neighbourhood sooner than their Years 5/6 colleagues had. The Prep teachers were confident in selecting and presenting materials and resources to stimulate and support learning experiences, as many of the examples in this chapter show. It is also likely that the significant role the material environment plays in early childhood education gave the Prep teachers license to experiment that perhaps their Years 5/6 colleagues did not have.

The extent to which teachers assumed responsibility for the further development of their interiors related directly to their perception of themselves as either creators, curators or custodians of their neighbourhood. As discussed in Chapter 4, the Bialik Prep teachers regarded themselves as both creators and curators of their spaces and they were deeply involved in creating engaging displays as prompts and provocations for children’s explorations. The Wooranna Prep teachers regarded themselves as curators of their spaces, and although their comments suggest they did not feel they had permission to change their interiors, the photographic data show they experimented with different spatial solutions to address organisational challenges as they arose. The Wooranna Years 5/6 teachers perceived themselves as custodians of their neighbourhood. Their comments and the visual analysis of their neighbourhood suggest that they were not confident, maybe even reluctant, to manage their interiors, especially documenting and displaying children’s work.

6.5.2 Team Teaching, Leadership and Collegial Relationships
The interview transcripts captured the dynamics of the teaching teams and the nature of teachers’ relationships with the members of other teams and the schools’ leaders. All teachers were greatly encouraged in the organisation and use of their spaces by their colleagues and developed confidence in their own design skills with their peers’ support. The contrasting experiences of Bialik teachers (who felt their efforts were supported by the schools’ leaders) and Wooranna teachers (who felt discouraged) highlight the importance of clear and consistent pedagogical leadership, support and encouragement for teachers working in collaborative environments to develop new pedagogical practices. These experiences also underline the importance of self-confidence in shaping teachers’ attitudes towards their interiors and their responsibility to maintain and develop them as vibrant and engaging venues for learning and discovery.
Bialik Prep teacher Vanessa explained that new ELC teachers were encouraged by their colleagues to experiment with spatial organisation: “I came into an empty room and sat in the middle of the room for a while and tried to work it through in my head... what experiences did I want the children to have within this environment?” Through this design process, and with input from her colleagues, Vanessa worked out her homeroom layout and the arrangement of furniture and resources for each setting. Later she involved children in the decision-making process as well: “We brainstormed with the kids, what are the areas that we need within the room to support our learning? ...Then what furniture do we have and how are we going to set it up?” This conversation is a concrete example of the discourse that the teachers developed around their homeroom spaces, which also helped develop children’s spatial awareness.

Close working relationships between the Bialik Prep teachers and the Hebrew studies teachers were instrumental in the creation of spaces and settings that worked for both the constructivist general studies program and the instructivist Hebrew studies program. For example, Vanessa used her group meeting area for games, construction, presentations and group discussions when children sat in a rough circle as shown in the illustration on the left in Figure 6.26. At other times children worked in small groups throughout the homeroom as shown in the centre illustration. By contrast, Hebrew teacher Rita regularly used the meeting area for direct instruction, transforming the setting into a mini classroom space with the small timber stools as work surfaces, as shown in the illustration on the right. When children were engaged in individual writing exercises they returned the stools to the tables and the whole room functioned as a conventional classroom.

**FIGURE 6.26 - Spatial Differences**
Bialik Prep Neighbourhood, Vanessa’s Homeroom
General Studies (left x 2), Hebrew Language studies (right)
Bialik Year 6 teachers reported regularly sharing ideas and teaching strategies with each other, and attributed the strength of their collegial relationships to Bialik’s *Cultures of Thinking* research partnership with Harvard (Project Zero, 2007). The aim of *Cultures of Thinking* was to develop teaching and learning strategies that enhance children’s learning by making their thinking visible (Ritchhart, Turner & Hadar, 2009).

Central proponents of *Cultures of Thinking*, Ritchhart and Perkins (2008), advocate “de-privatis[ing] teaching by providing and protecting time for teachers’ professional conversations” (Ritchhart, 2009, May). Year 6 teacher Joel, suggested that the collegial atmosphere at Bialik had not always been so congenial: “Before if someone had a good idea— ‘No, you didn’t see the good idea, no this was my idea’—people didn’t share ideas”.

Bialik Year 6 teachers also commented on the support they received from their school leaders. Their proposal to create a collaborative learning space in the corridor outside their homerooms (inspired by a visit to Wooranna) was supported and endorsed by Junior School Principal Pam. Joel said Pam “is good at stimulating opportunities and supporting us in whatever we want to try. She says ‘if you have an idea, do it. It doesn’t matter if it doesn’t work, have a go’”. So despite the limitations of the Year 6 teachers’ design solution, they managed to develop a collaborative and experimental practice supported by a leadership team who encouraged teachers to reflect on their professional practice and take responsibility for shaping all aspects of their physical and pedagogical learning environments.

*Figure 6.27 - Wakakirri Learning Documentation*  
Wooranna Years 5/6 Neighbourhood, Entry Gallery
Visual analysis of the material environment of the Wooranna Years 5/6 neighbourhood, in conjunction with teachers’ interview transcripts, indicate that they were reluctant to assume responsibility for managing their learning settings. Figure 6.27 shows a wall display, mounted by Featherston, of an award winning entry by Years 5/6 children in 2004 for Wakakirri, a competitive national arts festival for schools. Christine explained that the entry gallery had been likened to a museum because the same display was still hanging four years later. The teachers’ reason for not replacing the Wakakirri display was that they would not be able to reproduce Featherston’s design and their efforts would be criticised. Christine said:

What if I put my work up and it doesn’t look the same? What if someone comes in and goes ‘Oh that’s a hotchpotch’? We’re not interior designers. There’s this un-talked-about area, because yes, we would change it over, but it might not look the same.

The teachers’ comments suggest an underlying concern about aesthetics that is captured in another example cited by Christine, concerning some magnetic shapes children used to create images and patterns on the curved metal screen in the lounge setting, demonstrated in Figure 6.28. Christine explained: “Because they [the children] had cut them out a little bit incorrectly there was another point that had come through from someone else, ‘Oh take those down, that doesn’t look OK’, so down they all came”. These comments indicate the Years 5/6 teachers felt defeated in their attempts to use or change their interiors (to support children’s work and their own teaching practices) because the feedback they received was negative. They also expressed their concern that the out-of-date Wakakirri display in the entry gallery prevented children taking ownership of their learning neighbourhood because it was not connected to their own learning experience.
Wooranna Years 5/6 teachers attempts to prevent daylight spilling into the movement and performance space during AV presentations further illustrate their perception that they did not have the school leaders’ support to manage their neighbourhood effectively. The photo on the left in Figure 6.29 shows daylight spilling through the main doorway from the entry gallery making the screen more difficult to see. The photo on the right shows how teachers used a mobile whiteboard positioned across the doorway to exclude light, which was only partially effective and prevented the whiteboard being used elsewhere. Teacher David explained: “There used to be a piece of fabric that came across there but it just kept being pulled down, or wrecked in some way, so that [the whiteboard] is a more sturdy replacement”. The teachers hung the fabric in the doorway themselves because, as teacher Christine explained: “We did ask for a special curtain to be put in there for the viewing of DVDs and so forth, but we never got it”.

Like their Years 5/6 colleagues, the Wooranna Prep teachers perceived that they were not permitted to change certain things in their neighbourhood. However, the interiors of the Prep neighbourhood demonstrate they were more confident and ready to experiment with their material resources to achieve their teaching aims. The Prep teachers’ comments also indicate they were permitted to experiment with their spaces they did not consider their environmental practices to be under scrutiny. The Prep teachers worked together to manage noise levels and devise strategies for keeping each setting stocked with resources. They reported discussing the management of their learning settings frequently, although their comments suggest that their decision-making was not always collaborative - apparently teacher Carmel decided to construct the makeshift darkroom without agreement from the rest of the team.
Buckley, Schneider & Shang (2004) link the ownership of place and space with teacher job satisfaction, and it seems likely that the design decision-making by the Bialik and Wooranna Prep teaching teams influenced their sense of ownership of their spaces, and their organisation and use of the settings. Conversely, the disengagement of the Wooranna Years 5/6 teachers from their spaces appears to be the result of their perception that they did not have the support of the school’s leaders to become user-designers shaping their spaces to promote child-centred investigations. The juxtaposition of these three interiors with the Bialik Year 6 neighbourhood illustrates the significance of design as a pedagogical tool for teachers. The Bialik Year 6 teachers appeared to have the professional support they needed and the enthusiasm to experiment, but they lacked the resources to shape their physical environment to effectively support their changing teaching practice.

6.6 FROM THE THIRD TEACHER TO THIRD LAYER

This chapter has examined Featherston’s use of interior design to construct the environmental cues that communicated to children and teachers the opportunities for learning experience that lay in each space, place and setting in their neighbourhoods. It has also looked at the ways that the teachers developed and extended those cues in an ongoing dialogue with children about learning. As the examples in this chapter illustrate, these roles were equally important in ensuring that the neighbourhood interiors functioned effectively as the third teacher. However it was the teachers’ role as designers, responsible for the day-to-day management of their interiors, that this research has shown to be critical to the maintaining the alignment between learning and teaching practices and the places where they occur. This was because the environmental cues established by Featherston were not fixed, shifting and changing over time as children and teachers used and inhabited their spaces.

Each of the case neighbourhoods offered a slightly different perspective on how the interior environment influenced learning experiences. The Bialik Year 6 collaborative space demonstrated that without sufficient resources, or the appropriate design patterns to define and communicate the specific function of each setting, the existing classroom culture persisted. The Wooranna Years 5/6 neighbourhood showed that even purposefully designed and pattern-rich environments were less powerful influences on activity and behaviour than the ways that children and teachers habitually use their spaces. Nevertheless as the Bialik and Wooranna Prep neighbourhoods demonstrated deliberately designed learning settings did support a wide range of learning activities and relationships when teachers were able to effectively manage their interiors. This included developing an awareness of their neighbourhoods as holistic environments that required careful consideration of the introduction of new elements, especially digital technologies,
and how those would influence the environmental cues of individual settings and the function of the neighbourhood as a whole.

Featherston’s collaborations with the Bialik and Wooranna school communities were to help them assess what kinds of learning experiences they wanted children to have; to identify what they needed to facilitate those experiences; and to translate those needs into functional design briefs for new interior environments. The process of creating learning settings in response to those briefs involved the careful construction of cues and signals that communicated the purpose and function of each setting to both children and teachers. Featherston also played an educative role in explaining how to resource and manage those settings and environments. She set the stage, so to speak, and the teachers shaped the scenes by managing settings that directed children and teachers towards desirable activities and behaviours. As this chapter has shown, the transfer of responsibility for the neighbourhood interiors from Featherston to the school communities influenced how effectively teachers shaped their spaces, as did the support and encouragement they received from their colleagues and pedagogical leaders. The next chapter explores the role that teachers played in managing the small details of their material environments and significance of that work in helping to change the culture of learning in the case neighbourhoods.
7.1 THE SIGNIFICANCE OF SCHOOL STUFF

This chapter interrogates the ‘stuff’ of learning and the role that teachers play in selecting, managing and maintaining objects and artefacts, and using them to shape learning experiences for children. School stuff, such as pencils and paintbrushes, newspapers and magazines, props and costumes, chessboards and cards, computer programs and e-board markers, animal skeletons and fossils, occupies the changeable ‘third layer’, where interior design and material culture intersect (Featherston, 2009, p. 121). If the physical learning environment were a living organism, the building its bones, the furniture its flesh, material culture would be its lifeblood: the flow of nutrients and sustenance that keeps the environment alive and vibrant. The material culture of the case neighbourhoods was woven into the ways children and teachers incorporated furniture, equipment and digital technologies into their daily routines. These ‘things’ helped articulate the purpose of learning settings and spaces, and gave material expression to Bialik’s and Wooranna’s child-centred education philosophies.

This chapter explores the third layer as the domain of teachers. It argues that teachers at Bialik and Wooranna were pivotal to developing the material cultures of the case neighbourhoods and realising the potential of their interior design. They did this by selecting and presenting loose items, including board games and building blocks, and developing school routines around the use of tools and materials that supported children’s independent exploration of big ideas and research questions. There was an implicit expectation that teachers working in the neighbourhoods designed by Featherston would develop the appropriate design skills to choose and present loose items, and create effective displays to document children’s learning. This chapter examines the design training that was available to teachers and how effective it was in equipping them with the information, skills and confidence to maintain environments that would provoke children’s natural curiosity and desire to learn.
Lackney (2008) and Steele (1973) refer to the knowledge and skills teachers use to create and maintain learning spaces and places as environmental competence. Steele asserts that “two factors constitute environmental competence: (1) the ability to be aware of one’s physical environment and its impact; and (2) the ability to use or change that environment to suit one’s end” (p. 8). Lackney’s definition of teacher environmental competence is “the ability to understand and effectively use physical instruction space for a pedagogical advantage” (p. 133). Drawing on the experiences of teachers at Bialik and Wooranna, this chapter questions how teachers develop and share knowledge about their physical learning environments. It also suggests some strategies for providing appropriate support for teachers so that they can develop the environmental competency demanded by new learning neighbourhoods that are products of current school design reform.

7.1.1 Material Culture and the Third Layer

The material culture of school can be defined as the sum total of the tangible things, such as children’s artwork, books, rulers, overhead projectors, pot plants and posters, that are displayed on the walls and that populate the shelves and surfaces of school interiors. This definition also includes the daily routines that fold and thread those objects, artefacts and technologies into the fabric of school life. Like interior design, material culture has been overlooked as trivial, insignificant and ephemeral. However Attfield (2000) and Miller (1998) argue, that material culture—in the form of items displayed on supermarket shelves, and individual objects such as potato peelers and cars—is a powerful cultural force, capable of influencing human activity and behaviour and shaping cultural norms and practices, precisely because it has been disregarded as inconsequential, and has therefore escaped question.

Despite its previously lowly status the material culture of school, like school design, is now attracting research attention. Education historians including Rockwell (2005), Martinez (2005) and Dussel (2005) reveal the significance of objects and artefacts, such as keys, locks, school furniture, and uniforms. By examining how these items have been woven into the routines and relationships of school, historians demonstrate the role ephemerata have played in shaping school behaviours and identities. They also reveal how objects and artefacts, referred to as classroom technologies, have been used by teachers to convey specific cultural attitudes about education such as discipline and control.

Lawn and Grosvenor, for example, explain that:

a slate cleaning drill involved sponges, a yardstick, a shallow tin, a cupboard and a series of movements by the teachers and the child. A simple system constructed for a critical purpose, it had to maintain discipline, establish routine and be effective (Lawn & Grosvenor, 2005, p. 13).
The objects and artefacts that circulate in the material environment are assigned different terminology by different authors. Featherston (2009), as discussed in Chapter 6, conceptualises physical learning environments “as being made up of three layers: the building shell, the internal settings and loose items” (p. 121). For Featherston ‘loose items’ refers collectively to objects, artefacts, tools and technologies, which reside in the third layer—the material environment. Brand (1994) presents a similar model of the built environment, conceived as six layers: site, structure, skin, services, space plan and ‘stuff’ as illustrated in Figure 7.1. For Attfield (2000) the material environment is filled with ‘things’. Loose items, stuff and things all refer to material objects that are used to customise and personalise all interiors, and which express the identities, values and culture of the people who live and work in those spaces.

![Figure 7.1 - Brand’s Six Layers](image)

**Figure 7.1 - Brand’s Six Layers**
Illustration based on “Shearing Layers of Change” (Brand, 1994, p. 13)

### 7.1.2 Props, Prompts and Learning Provocations

The material environment of school learning settings is a concrete expression of how teachers use props to engage children in learning. Perkins (1986) describes children at Crow Island using wooden orange crates to create a train, which literally became the vehicle for their explorations of transportation and geography, as discussed in Chapter 2. He goes on to describe how the children transformed the same orange crates into a shop, explaining that the transformation was inspired by some food tins added to the orange crates by the children’s teacher. The orange crates provided what Thiel (1997) describes as the scene - the place where the action happens. Miller (2005) argues that material objects, such as the tins, can reframe the action, which Keane (2005) suggests prompts people to construct new narratives. ‘The shop’ was the new story children told about the orange crates to embrace the food tins.
The evidence of the Bialik and Wooranna neighbourhoods is that the challenge for teachers is to understand how the material environment communicates and how to manipulate loose items to create the desired communication. Featherston suggests that understanding the importance of ‘stuff’ is the key. This includes knowing where to get stuff, how to use, store and display it, and how to maintain the magical complexity of learning environments without having too much stuff. The visual analyses of the case neighbourhoods indicate that being aware of the suggestive power of objects, tools and resources is also important. Bialik Prep teacher, Vanessa created a small display asking children “What did you do on the holidays?” She covered a low display stand with gold and pink organza and nestled within the folds of fabric small vessels: perfume bottles, candle holders, tiny teapots, shallow bowls, and ornamental boxes. The effect of the setting was fantastical, evoking impressions of genies in lamps and messages in bottles. Here, Vanessa used material objects to provoke learning experiences via the tiny vessels, each of which was an invitation to write a holiday story.

Perkins’ (1986) orange crates and food tins, and Vanessa’s story vessels, are examples of material objects selected and displayed by teachers specifically to provoke children’s interest and curiosity (Upitis, 2011, 2014). The objects selected by teachers contribute finely tuned information to the environmental cues for learning activities and behaviour. These objects suggest possibilities for investigation, which children respond to following their natural drive for discovery. Through these self-directed investigations, children learn. In the scene described by Perkins the teacher did not organise the orange crates and food tins to suggest a shop, she simply added the food tins to the scene and the children responded by linking together the two kinds of materials objects they found into a narrative about a shop. Equally they might have decided to pack the food tins into the crates and extend their earlier explorations of transportation - delivering the tins by train to the supermarket. The point is that the outcome of their investigation was not predetermined and was reached through their own discovery, which is the intention of child-centred pedagogy as defined by Moran, Desrochers & Cavicchi (2010).
7.2 MAKING LEARNING VISIBLE

Reggio educators’ practice of documentation aims to make learning processes visible and therefore accessible to others (Giudici & Rinaldi, 2001). It can be inferred that learning processes are otherwise invisible, or at least difficult for anyone other than teachers to study, because only they are able to closely observe children’s learning journeys over time. Reggio educators’ work is based on detailed analysis of practice, which is used to generate understandings. They use documentation to capture the processes of research and discovery, and record children’s learning strategies and pathways in a form that can be analysed. By gathering samples of children’s work and recording their ideas Reggio educators map the changes in children’s thinking and understanding. They also document the methods and techniques children use to conduct their investigations and describe the various learning relationships they are engaged in at different stages of the investigation.

At Bialik and Wooranna teachers documented children’s learning by taking photographs of their activities and work, and making written records of children’s conversations and reflections on their own learning. Together with pieces of children’s writing, drawing and painting, these records were used to tell the stories of children’s research, experiments and investigations. It is important to note that although Bialik Prep teachers and Wooranna Prep and Years 5/6 teachers followed Reggio’s practice of documentation, they were doing so under different circumstances. Each Reggio Centre employs a teacher with an arts background, an *atelierista*, who assists teachers with documentation. Reggio’s preschool curriculum and learning investigations called *progettazione* also have a strong bias towards the arts and visual representation, and in response to the hundred languages of children its pedagogy uses expressive and poetic languages to build knowledge.

The primary school curriculums at Bialik and Wooranna were less heavily grounded in the arts, and although the schools’ art specialists assisted teachers, the visual culture at Bialik and Wooranna was in its infancy compared with Reggio’s that has developed over 30 years under the guidance of Vea Vecchi, *atelierista* at Reggio’s renowned Diana preschool.

At Bialik and Wooranna teachers made rough documentation that reflected the progress of active learning investigations, and what Reggio educators refer to as the ‘final memory’, which is the lasting record of a completed investigation (Giudici & Rinaldi, 2001). Rough documentation is raw data, including teachers’ hand-written notes, photographs and pieces of children’s writing and drawing that record their current thoughts and understanding from their investigations. It may include children’s speculative theories or detail their investigative strategies. Reggio educators attempt to communicate the many possibilities present in children’s thinking, rather than trying to document everything or
to present an ‘unquestionable truth’ (Hobba, 2007, May). Rough documentation is physically and graphically crude, held together with bulldog clips, as in Figure 7.2, and hung on pegs for display. Its crudeness suggests an unadulterated conversation between children and teachers shared with parents and the school community.

Final memory documentation is a more formal record of the key aspects of a learning investigation. Children and teachers decide together what elements of learning documentation best tell the story of their investigation. Figure 7.3 is an example of a large display panel that tells the story of the Wooranna Year 2 Puppet Project, which helped shape the design brief for the Wooranna Years 5/6 neighbourhood interiors. The process of selecting the material gave children an opportunity to revisit and reflect on what they have learned. Final memory documentation is designed to communicate with a broader audience, including visitors to the school, and it borrows from the graphic language of contemporary museum displays. Photographs, text and other material are organised within ample white space according to a formal grid layout. Visitors to Reggio’s preschools (and its many international touring exhibitions) see examples of the permanent records of progettazione (Millikan, 2007, May).
7.2.1. *Communication through Documentation*

Because it records the processes of learning, documentation functions as a material expression of a school’s pedagogy and philosophy. Figure 7.4 shows the rough documentation produced by the Bialik Year 6 community during their human body investigation, which recorded children’s wonderings and growing understandings about the human body, as discussed in Chapter 6. Its form, an over-sized poster, and the materials used (paper, markers, pens and post-it notes) contributed to the immediacy of children’s questions. The emphasis was on ideas and children’s development as curious and critical thinkers, both of which reflect Bialik’s *Cultures of Thinking* philosophy.

Here there is an interesting synergy between Reggio’s concept of making learning visible and Project Zero researchers Ritchhart and Perkins’ (2008) notion of making thinking visible, the latter having been influenced by the former. The human body documentation helps make explicit the thinking routines developed by Project Zero and introduced to Bialik during their collaboration on the *Cultures of Thinking* project (Ritchhart, Palmer, Church & Tishman, 2006, April). This makes it a valuable tool for children’s and teachers’ reflections on thinking strategies and the function of questions in inquiry.

Figure 7.5 shows the Wooranna Years 5/6 final memory documentation for *Wakakirri*, also mentioned in Chapter 6. A collection of photographs of the children’s performance and the trophy they were awarded, accompanied by short passages of descriptive text, were presented in two wall-mounted Perspex display cases in the Years 5/6 entry gallery. The graphic language of this documentation and the materials used, together with the white walls of the entry gallery and the spot lighting, evoke the aesthetic of an art gallery. The *Wakakirri* documentation is a material celebration of children’s achievements and demonstrates the respect shown to their work by Wooranna’s school community.
Descriptions in the interview transcript of how Wooranna Prep teachers documented children’s learning suggest that their rough, hand written documentation had greater potential as a tool for communicating with the whole learning community than they had previously considered. At the end of learning agreement sessions and workshops, teachers made handwritten records of children’s thoughts, comments and reflections using broad felt-tipped markers and large sheets of newsprint paper as in Figure 7.6. Prep teacher, Carmel and support officer, Ellen said that teachers’ handwritten records were an important way for teachers to model handwriting to Prep children and that children enjoyed watching teachers writing what they said. Prep teacher, Kate’s comments suggest that if these handwritten records were displayed, they may be a useful support for the teaching team giving them more opportunity to keep abreast of each other’s teaching practices. Carmel suggested the rough documentation may also be useful for connecting the school community, especially parents, with children’s daily activities.
These few examples of documentation at Bialik and Wooranna illustrate the differences between rough and final memory documentation that prompt questions about the link between documentation and learning experience. The immediacy of the Bialik Year 6 human body documentation was directly connected to children’s learning experience. Some children’s responses to their peers’ questions were confident, others were speculative. The ephemeral post-it notes spoke of the children’s day-to-day learning practices, and the spectrum of their responses represented the growth of their understanding in real time.

This immediacy was not evident in Wooranna’s Wakakirri final memory documentation, which the Years 5/6 teachers described as a window onto the past because the children involved in the competition were no longer at the school. Interestingly Reggio displays documentation of past progettazione to reflect its history and culture, but at Wooranna teachers were concerned that children could not see themselves reflected in the Wakakirri display. The challenge for interior designers is to create a variety of display spaces where school communities can remember the past and celebrate the present.

7.2.2 Documentation and Teaching Practice

Reggio educators use learning documentation as a vehicle for research and for studying and improving their own teaching practice. An example of how learning documentation was used for similar purposes at Bialik is captured in Ritchhart and Perkins’ description of a professional study group session conducted as part of the Cultures of Thinking research project. During the session a group of teachers discussed and analysed the documentation by Year 1 teacher Roz of her class’s conversation about the Beaconsfield Mine collapse that occurred in Tasmania, Australia in 2006:

Her colleagues noticed that student responses signaled great empathy and curiosity and marked emerging mathematical and scientific ideas about types of rocks, weights, distances, and cause-and-effect relationships. They noted that students presented evidence for all their statements, sometimes without prompting, and showed rich awareness of informational resources.

As the discussion expanded questions emerged about the power of starting with student interests, the role of the media in presenting information and adults’ role in censoring that information. Issues arose about what opportunities students should have to delve deeply into ideas, explore their own thinking, and pursue research. Teachers suggested that Roz might extend the exploration into geology, Australia’s natural resources, and the process of mining—or connect it to a discussion of survival skills and how events affect communities. Roz not only could see her students’ thinking more clearly, but also could better situate their learning within the school’s collective efforts (Ritchhart & Perkins, 2008, p. 60).
Through discussion and analysis, Roz and her colleagues uncovered the lessons for teaching practice that Rinaldi (2009, September) suggests are embedded in children’s learning processes made visible by teachers describing them as they happen. Although Ritchhart and Perkins (2008) focus on a description of the learning experience without reference to the physical or material context where the activities occurred, the Wooranna teachers’ documentation of *Our Melting Pot* and the *Puppet Project* investigations indicate that teachers do reflect, albeit obliquely, on the selection of inspiring objects, the arrangement of tools and materials, and the organisation of space in their records. The photographs teachers took show the particular materials that children use in their work and sometimes how those materials were stored and presented for children to use. This information is enormously useful for designers creating learning settings because it shows how children and teachers use their spaces. For the same reason it may also assist the development of teachers’ design skills.

### 7.3 Teachers’ Knowledge, Induction and Enculturation

Pointon and Kershner’s (2000) observation that experienced teachers make immediate and intuitive decisions about their teaching spaces is supported by the research findings of Martin (2002) and Lackney (2008), which suggest that teachers develop environmental competence through trial and error and with experience. During the interviews with the Bialik and Wooranna teams, all teachers demonstrated their awareness of the design of their neighbourhood interiors. Some teachers’ comments suggested that they were also aware that the design of individual learning settings influenced children’s activities. The photographic data suggest teaching teams who said they regularly discussed strategies for using their learning spaces to support children’s activities, also demonstrated some skill in creating engaging places for children to work. However, the photographic data and visual analyses of the neighbourhoods indicate that not all the teachers used or manipulated their spaces in ways that suited their pedagogical aims. Martin (2002) describes this as “awareness without competence” (p. 154), which raises questions about how teachers learned to use their neighbourhood interiors and how they shared that knowledge with their colleagues.

#### 7.3.1 Teacher Training and Environmental Education

Teacher-training experiences recounted by teachers at Bialik and Wooranna during this study indicate that the physical learning environment receives little attention in tertiary education programs. The comments of five teachers from both schools, with between five and 20 years teaching experience, indicate that teachers were trained to teach in conventional classrooms with conventional furniture arrangements because these environments were the norm. Of seven recent graduate teachers with fewer than five
years teaching experience, only Bialik Prep teacher Vanessa recalled receiving any training about learning spaces, “I remember having one hour actually on how would you set up a room. I think it was just more of an activity in our Uni. class. It was kind of like ‘how would you set-up a classroom?’ It wasn’t ‘what thought are you putting into it?’” Two student teachers doing school placements at Bialik and Wooranna coinciding with this research, also reported having received no training about learning spaces to that point in their studies.

The teachers and student teachers participating in this study represent a small sample of Victoria’s teaching population, yet their formal training experiences are typical and highlight a gap in tertiary education. Recent school building reforms to replace traditional classrooms with child-centred learning environments require skilled teachers who can use the new spaces effectively. Some tertiary institutions are aware of the growing need for education graduates to be environmentally competent and for architecture graduates to be pedagogically aware. Collaboration between Architecture and Arts Education at the University of Melbourne launched a Masters course called *Innovative Spaces and Pedagogy* in 2011. This course aims to make education and architecture students aware of the contribution that the physical environment can make to learning and teaching experiences and practices. The educators involved in this program are also involved in the University of Melbourne’s LEaRN research group mentioned in Chapter 1.

### 7.3.2 Teachers Joining Teaching Teams

Although teachers reported little formal training about how to use learning spaces to support teaching practice, their informal training experiences were varied and meaningful. Prep and Years 5/6 teachers at Wooranna recalled an introductory tour of the school facilitated by Assistant Principal, Louise. During the tour Louise explained the relationship between Wooranna’s education philosophy and its Featherston-designed neighbourhoods and learning settings. Years 5/6 teacher, David recalled studying Featherston’s design documentation of the Years 5/6 neighbourhood and reading about the *Inside-Out Project* online (see Featherston, 2006). Years 5/6 teacher, Rachel emphasised the importance of guidance from more experienced members of her teaching team saying “they sort of explained the space and how it works”. Rachel also described learning how to manage the materials and resources in the studio lab with guidance from the school’s art specialist, Carla.
Woodcock (2008) observes that UK teachers working in purpose-designed polysensory classrooms, specifically developed to meet the needs of children with autistic spectrum disorders, undergo specialist training to use those environments effectively. At Wooranna a school-wide induction and training program for all staff was introduced in 2009. At that time 17 new teachers joined the Wooranna staff and several of the school’s skilled teachers moved to other schools. The combined effect placed considerable strain on the community’s cultural capital about using and maintaining the learning neighbourhoods. The training program, which was delivered during a staff retreat, included sessions facilitated by Featherston to develop design skills and techniques for displaying learning documentation. Wooranna Years 5/6 teachers commented that these sessions were scheduled in the evening when teachers were tired and time was limited. They said that the sessions were valuable and they would have liked more training in these areas.

At Bialik induction for teachers was largely informal and, like their Wooranna counterparts, Bialik teachers described a supportive collegial environment. Bialik teachers also said that their involvement in the school-wide Cultures of Thinking study groups gave them access to colleagues from all year levels with opportunities to share ideas and strategies, including those for managing learning materials and spaces. Opportunities for regular school-wide discussions were not available at Wooranna. Years 5/6 teacher, Rachel, described an “island mentality”, which she attributed to the fact that the senior and junior year levels had different lunch breaks, which reduced the opportunities for teachers’ informal conversations. Years 5/6 teacher Christine’s suggestion that teachers need “a chance to pick each other’s brains” and to share ideas also indicates that there was no formally established dialogue between the teaching teams.

The comments of teachers at Bialik and Wooranna indicate that the collegial environment influenced the development of teachers’ environmental skills. More experienced teachers guided new and less-skilled colleagues, and conversations about shared spatial practices were conducted in collegial groups. This indicates that in addition to the skills and knowledge that teachers developed through experimentation, formal education, and induction, they also developed design skills through dialogue and collaboration. Teachers’ recollections of their school inductions placed greatest emphasis on these informal conversations and collaborative exchanges with more experienced colleagues, which suggests that exchanging ideas and experiences as well as building a shared dialogue may be key strategies for developing and cementing teachers’ design skills and knowledge.
7.3.3 Children Entering Learning Neighbourhoods

During their interview Wooranna Prep teachers described formal and informal induction processes experienced by children in their neighbourhood. They reported spending time with children at the beginning of the school year exploring the learning spaces together. This exploration period was to help children develop awareness of their neighbourhood environment and how to work cooperatively with their peers in each learning setting. The Wooranna Prep teachers noted that many of the children had been informally inducted into the learning neighbourhood by their parents. Carmel explained that younger children accompanying their parents to collect Prep children waited in the lounge setting and watched the fish. From the lounge younger children watched the older children moving through the neighbourhood. By observing the neighbourhood routines they were learning how to use the spaces and how to be Prep children.

Bialik music specialist, Lila estimated that 98% of Prep children in the ELC came from the 3 and 4-year-old kindergarten rooms downstairs, with only a handful of children joining the school for the first time in Prep. Bialik Prep teachers, Vanessa, Dawn and Sophie, reported that the children from the kindergarten rooms were familiar with the ELC routines and showed new children how the homeroom and plaza spaces functioned. Vanessa suggested that visual clues provided by the learning resources in each setting also helped. Art and technology specialist, Anita, said “I think it’s also about ownership... children understanding the spaces... and the expectations and the resources available”. She explained that the teachers involved children in building up the resources so children understood the purpose of the spaces. When visitors came to the school it was the children and not the teachers who showed them around the ELC.

Induction for children entering the Bialik Year 6 neighbourhood was not really an issue because the homeroom spaces were essentially the same as their Year 5 homerooms, but for children entering the Wooranna Years 5/6 neighbourhood the situation was slightly different. Teachers Christine and David expressed concerns about inconsistent practices across the school, which they suggested caused problems for Year 4 children being inducted into Years 5/6. David observed that learning journeys, learning agreement time and learning projects all look different in the Years 3/4 neighbourhood compared to the Years 5/6 neighbourhood. Christine suggested that inconsistent teaching practices meant that children were unsure of what was expected of them. Her assessment was that children entering the Years 5/6 neighbourhood were “paralysed” because they did not know how to operate, which she indicated may have contributed to their poor performance in NAPLAN literacy and numeracy tests.
7.3.4 Enculturation into Learning Communities

Vygotsky (1978) and Rogoff (1990) characterise children as cultural novices who seek guidance from adults about what activities and behaviours are appropriate in particular places and contexts. Bialik and Wooranna teachers communicated to children how to use and how not to use their learning environments by modeling behaviours and mediating children’s choices. Wooranna Years 5/6 teachers were concerned that they over-policed children’s use of furniture, as this short exchange between David and Rachel illustrates:

David: Like we’ll say “Those chairs don’t belong in this room.”
And they’ll be like...
Rachel: Oh and red chairs around the conferencing table, and
“the black chairs are not meant to be in the theatre space, you’re meant to be sitting on the blocks [rostra]”.

David and Rachel’s exchange is even more interesting in light of Pointon and Kershner’s (2000) study, which suggests that the ideas and beliefs that children have about their school environments, including the spatial organisation of their immediate surroundings, “echoes the philosophy of their teacher” (p. 126).

Bialik and Wooranna Prep teachers regulated children’s choices by making a limited number of activities available in each learning setting during negotiated learning periods. Bialik Prep children signed up for the activities they wanted to do on individual ‘learning lab’ sheets that listed what activities are available in each setting. Wooranna Prep teachers use a similar system, explaining that it would be too time-consuming and impractical to discuss with each child what they would like to do, and where they would like to work, at the beginning of each session. Instead children had a menu of options to choose from, for example in the small-scale construction area they could design and build a garden, or in the studio lab they could represent a page from their food diary with modeling clay. Through these selection and negotiation processes teachers helped children develop awareness of how to behave and interact in each setting. They also guided children in the development of daily routines that connected particular activities and working relationships to specific places, tools and resources.

The Wooranna Prep teachers’ explanation of how they named each setting in their neighbourhood demonstrates the careful consideration they gave to creating consistent experiences and smooth transitions for children, between learning settings and from Prep into the Year 1 neighbourhood. Prep teacher Kate, for example, recalled a discussion when she and her colleagues agreed that the names for each setting should describe the activities available to children in that place. But they were concerned that the names should not limit or constrain children’s activities to specific settings. For example,
children should be able to solve mathematical problems in connection with any investigation anywhere in their neighbourhood, not just in the maths problem solving area. The Prep teachers opted to use the same names given to the learning settings in the Years 5/6 neighbourhood so that children had consistent expectations about what to expect in the same kind of setting anywhere in the school.

Observations conducted in the Wooranna Prep neighbourhood suggest that children learned desirable patterns of behaviour, such as sharing and working together, in connection with particular physical contexts. The communication setting was where children did writing and drawing. The environmental cues manifest in the clean work surfaces, comfortable chairs and good natural light, expressed the purpose of the setting for table-based writing and drawing activities. The communication setting was bounded on two sides by open shelves where writing and drawing materials were stored so that children could reach them. Figure 7.7 shows one shelf where jars of coloured pencils were stored, one jar of pink pencils, one of orange, one of yellow and so on. The way that children used these pencils revealed their detailed knowledge of the tools and materials they used, and their awareness of how these things helped them to make their own choices, work with their peers and share their resources.

During one learning agreement period a group of five Wooranna Prep children chose to work together in the communication setting to make a greeting card for Principal Bryan. They collected the things they needed from the shelves: paper, glue and scissors. One member of the group ferried the jars of coloured pencils to the table and another child asked “What if someone else wants a pencil? They won’t know where they are, because we’ve got them all.” After a short discussion the children solved this problem by each choosing a different coloured pencil and returning the rest (in the jars) to the
shelves. This was an example of the kind of collaborative working relationships that children at Wooranna were encouraged to develop. By working together and taking one pencil each they solved the problem by pooling their resources. The children’s problem-solving activities, conducted without assistance or direction from adults, is evidence that they had learned and understood the significance of their material environment, as well as their responsibilities towards each other (as members of a collaborative learning community) to share resources.

7.4 DEFINING TERRITORIES AND CONSTRUCTING IDENTITIES
Martin Lawn (2005) argues that the teacher’s desk and child’s chair are potent symbols of learning and teaching, which Burke and Grosvenor (2008) suggest are important sites for identity construction, co-opted in expressions of territorial behaviours (E. Hall, 1966). As a collection of objects, all the chairs in a classroom are essentially the same. Apart from individual quirks, such as a wobbly leg or a lump of chewing gum stuck under the seat, one chair is indistinguishable from the next. A particular chair is identified by its specific location in the classroom and perhaps its association with the child who regularly occupies that seat. Pointon and Kershner (2000) suggest that the surroundings immediate to the chair, such as a table, a window or even floor space, become the territory of the child who occupies the chair.

Malnar and Vodvarka (1992) note that, like American anthropologist Edward Hall, Robert Ardrey, author of The Territorial Imperative, considers territoriality innate to humans. However Ardrey suggests that territorial behaviour can be influenced by cultural experience. This is significant because it suggests that children and teachers’ territorial instincts can be tempered by changing routine practices and expectations surrounding the use of particular spaces, settings and furniture types. The evidence of the case neighbourhoods is that children do learn collaborative behaviours and routine practices that can override territorial possessive instincts, as illustrated by the Wooranna Prep children sharing the coloured pencils. Interviews conducted with the leadership teams at Bialik and Wooranna also revealed deliberate strategies used by the school communities to overcome ingrained patterns of territorial behaviour associated with cellular classrooms.
7.4.1 Territorial Behaviours in Collaborative Communities

The Bialik community decided to provide fewer stools than the number of children in each Prep homeroom, to shift children’s expectations away from individual ownership towards sharing and collaboration. ELC Principal, Sonia, recalls that before moving into the new ELC building:

children were [already] working in small groups, [however] there was still a real huge sense of ownership of their chair... that’s why we came up with the idea that no one would have their own chair. Their locker would be their space and everything else was shared...

Children and teachers used lightweight timber stools produced by IKEA and selected by Featherston as seats, tables and temporary display stands. Children moved between different activity settings in their homeroom and no one had a fixed workstation. Bialik Prep teacher Dawn observed that the absence of “individual tables, where children keep their own things, adds to that sense of collaboration—that sense of group”.

This was not the case in either the Bialik Year 6 neighbourhood or the Wooranna Years 5/6 neighbourhood, where children each had a personal store of tools and materials. At Bialik children stored their things in lockers and on their tables. At Wooranna children each carried an A4 plus size zip-up compendium containing their stuff, Figure 7.8. They were introduced in response to children’s express wish for personal equipment. Teacher Rachel’s assessment was that the daily neighbourhood routine:

only works because all the students have those zip-up folders [compendiums]. They have everything with them wherever they go. If they didn’t have something like this which makes them mobile, if they had to lug a pencil case and their books and get out the book that they needed for a particular
The form and carrying capacity of the compendiums enabled children to establish mobile, independent territories throughout their neighbourhood and reduced their need to access their lockers during learning periods.

Rachel’s comments place the compendiums at the centre of the Years 5/6 neighbourhood routine. However, the time-lapse sequences indicate that children’s use of compendiums resulted in learning behaviours that were at odds with the collaborative culture that Wooranna was trying to develop. Children used compendiums as portable workstations, which meant that they could pursue individual study activities in any setting regardless of the environmental cues, as discussed in Chapter 4. The photographic data suggests the compendiums helped direct children’s focus inwards to their individual learning experience. This contradicted the environmental cues embedded in the neighbourhood interiors that were calculated to draw children’s attention to the possibilities for exploration and discovery in each setting. It was also at odds with Wooranna’s efforts to encourage children to work together as co-researchers in shared learning investigations.

The patterns of activity and behaviour plotted from the time-lapse sequences indicate that despite the different designs of the four case neighbourhoods there were similarities in territorial behaviours between the two Prep cohorts, and between the Bialik Year 6 cohort and the Wooranna Years 5/6 cohort. Children in the Prep neighbourhoods exhibited patterns of movement and distribution that suggest they were equally comfortable working in all the settings in their learning neighbourhoods. No territorial issues were apparent and they assumed joint ownership and responsibility for all settings and resources, as demonstrated by the two scenes in Figure 7.9. It is likely that the absence
of territorial behaviour was a product of the integrated curriculum that both Prep cohorts were working with, which directed children to use all the settings in their neighbourhood on a regular basis. Also children in both Prep neighbourhoods were encouraged to develop collaborative behaviours through the use of shared materials and resources, because other than their writing journals and workbooks they had no personal items.

Similarities between the activities and behaviours of Bialik Year 6 cohort and Wooranna Years 5/6 cohort, despite the two very different neighbourhood designs, suggest that the age and development of children may also have influenced territorial behaviours. Children in both neighbourhoods exhibited similar working postures and activities, as the boy at Wooranna and the girl at Bialik illustrated in Figure 7.10 demonstrate.

Bialik Year 6 children had individual tables that constituted personal territories, whereas Wooranna Years 5/6 children used their compendiums to define individual, portable territories within a shared environment. These are both expressions of territory in relation to personal identity which, Carter (2006) points out, is an important part of young adolescents’ social development. The ways that Wooranna Years 5/6 children used their neighbourhood are particularly significant for this study because they raise questions about how to create opportunities for older children to express individual and group identities within shared environments and a collaborative culture.
7.4.2 Individual and Group Identities in Shared Spaces

FIGURE 7.11 - Home Group Identities expressed on Homeroom Doors
Bialik Year 6 Neighbourhood, Aaron’s homeroom (left), Judith’s homeroom (centre), Joel’s homeroom (right).

Featherston (2009) argues that the third layer “expresses the identity of a particular community, reflecting their backgrounds, interests and development of ideas” (p. 121). Hidalgo & Hernandez (2001) and Twigger-Ross & Uzzell (1996) suggest that people use the places where they live and work in the formation of individual and collective identities and that these places function as canvases where individual and collective identities are expressed. This was evident in the Bialik Year 6 neighbourhood where each of the three home groups had decorated their homeroom door to reflect their group identity, as shown in Figure 7.11. These identities were separate from their collective neighbourhood identity evident in the displays of children’s work exhibited in the Year 6 collaborative space and shown in Figure 7.12.

FIGURE 7.12 - Neighbourhood Identity
Bialik Year 6 Neighbourhood, Collaborative Space
Inside the Year 6 homerooms was evidence of what Manning (1967) describes as teachers’ personal organisational preferences and attitudes about tidiness. Figure 7.13 shows the hand-decorated fabric curtains made by the children to screen their open-faced lockers. In Judith’s homeroom children’s books and pencil cases were housed on their tables in decorated cardboard trays. Judith and Joel’s homerooms demonstrated what Smith (1974) refers to as teachers’ ‘enthusiasm for display’. Their walls were crowded with examples of children’s work and learning resources such as vocabulary and spelling lists. Figure 7.14 shows the statement of conduct for social circle meetings in Judith’s homeroom and a statement of the home group’s values, “passion, respect, integrity, commitment and empathy”. All the teachers suspend displays from their ceilings, and learning resources lined every available surface. Aaron’s wall displays were less dense than Judith’s and Joel’s and centred on the human body investigation. This was possibly a reflection of the online practices Aaron was trying to foster with his home group.
The Bialik homerooms illustrate four different group identities, which the visual analyses indicate were strongly influenced by each teacher’s approach to organising and decorating their environments. Some teachers made overt personal statements, such as Year 6 teacher Judith’s shrine to her Australian Football League (AFL) team, the St Kilda Saints in Figure 7.15, while others selected personal items to enhance children’s learning experience. Prep teacher, Sophie brought cactuses, insects and a reptile into her room. She explained that teachers brought things in “as provocations, or simply to set up a nurturing and friendly environment to show children this is part of who I am, these are the types of things that I collect, appreciate and take care of in my life”. At Wooranna group identities were not linked to home groups but to whole neighbourhood communities. Neighbourhood identities were the summative expression of many small details including pet fish, live plants and framed artwork, which together identified each learning community as investigators of the real world.

7.4.3 Teacher Ownership of Neighbourhood Interiors

Linked to the concepts of territory and identity are notions of ownership and control. The interviews conducted at Wooranna suggested that teachers equated not having permission to change the displays and alter the layout of their spaces with a lack of ownership. When asked whether the Prep interiors would support displaying rough documentation Carmel said “It could, but we’re not allowed to put nails up. We’re very limited in how we use the walls”. In fact a large portion of the walls in the Prep neighbourhood were pin-board, so although nails may not have been allowed other means of display were available. This raises questions about the extent to which teachers were aware of the display options in their neighbourhood and what support they had to create frequently changing displays of children’s research and
experiments. Nevertheless the photographic data indicate the Prep teachers were confident experimenting with their spaces, which may be due to Carmel’s previous experience teaching in a classroom space that she had organised experimentally into dedicated learning settings, and Kate’s previous position in a resource-rich pre-school setting.

Conversely Wooranna Years 5/6 teachers’ reflections on their attempts to create effective displays and work with the spatial organisation of their neighbourhood indicate that the negative feedback they received discouraged them from experimenting and undermined their confidence. The transcript of the interview with this teaching team suggests that the teachers did not feel that they had ownership or control over their learning spaces. Wooranna Principal Bryan explained:

> It’s a two edged sword. Because you’ve got teachers who weren’t involved in the initial set-up, who want to establish ownership of the room. Inevitably they’ll move things around and want to move things around. As principal, I’m caught between saying, “No don’t move it around because this Unit [learning neighbourhood] has been designed in a certain way”, and “we realize there are limitations, but we believe it’s the best of the world that we can create.” I don’t want to stop them from taking ownership of the area. If they haven’t got ownership of it, we’re back to square one.

Bryan’s comments considered in light of the teachers’ lack of confidence to take on shaping their neighbourhood interiors clearly express the tension between following the intention of Featherston’s designs on one hand and encouraging teachers to take responsibility for their learning spaces on the other.

For the Wooranna Years 5/6 teachers there was also a tension between their collective responsibilities and individual ownership. Teacher David noted that sometimes it was challenging to reach consensus when five different voices were contributing to a discussion, but he and Rachel both stated how much they valued teaching with their colleagues. Despite working as a team, their descriptions of life in their learning neighbourhoods were peppered with possessive statements including ‘my kids’, ‘my home group’, ‘my home room’, ‘my community welfare group’, ‘my work’, ‘my laptop’, ‘my resources’ and ‘my things’. Teachers also expressed frustration at not having anywhere in their neighbourhood to keep their own things, such as pens and water bottles, and samples of children’s work. Rachel explained, “[for] my last project, I just took a drawer [of the plans press] in the studio lab [her home base] and just put all my environment work in it… documenting the whole time, keeping work samples”.

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Bialik Year 6 teachers faced significant challenges negotiating joint ownership of their homerooms which they shared with Hebrew studies teachers. The homerooms were mainly used for general studies but for one or two periods each day they were used for Hebrew studies. During their interview Joel, Judith and Aaron explained that they had little scope to organise their spaces and arrange the furniture to suit their own informal teaching styles because the Hebrew studies teachers were working with an instructivist pedagogy and wanted the children to face the front of the room. Judith was determined for her children to work in small groups, so she arranged the tables in clusters so that children could face the front of the room, and collaborate with their peers. This difficult spatial and pedagogical balance was confirmed by Junior School Principal, Pam, who described Hebrew studies as “a very, very structured program that comes with magnificent charts—commercial charts that take over the walls”. She also identified the conventional spatial arrangements the Hebrew teachers insisted on as the reason that plans to redesign the Years 5 and 6 homerooms as an integrated learning neighbourhood had stalled.

Figure 7.16 - Shared Ownership
Bialik Prep Neighbourhood, Vanessa’s Homeroom
General Studies Display (left), Hebrew Language Studies Display (right)

Bialik Prep teachers also shared their homerooms with Hebrew studies teachers, but their comments indicate that they were able to negotiate a workable solution with the Hebrew studies teachers that suited them both. As mentioned in Chapter 6, Prep teacher Vanessa’s homeroom was organised to suit her informal teaching style, but by employing the children’s stools as tables Hebrew studies teacher Rita was able to quickly and easily transform the home group meeting area to support the instructivist Hebrew studies program. Vanessa and Rita also negotiated joint ownership of the limited wall space in their classroom. They did this by designating specific areas for Hebrew language
material and other areas for general studies. The photo on the left in Figure 7.16 shows part of the wall display that Vanessa created to support her general studies program. The photo on the right shows the Hebrew language display that Rita made on the wall space around the e-whiteboard where she conducted her classes. Rita used her display as an instructive tool and a visual prompt for children.

The photographic data, visual analyses and interview transcripts suggest a close connection between each team’s perceptions of ownership and control, their confidence in their design skills, and how they arranged furniture, selected resources and created displays. Bialik Prep teachers expressed ownership of their learning spaces and confidently organised and arranged them to suit their teaching practices and the Hebrew studies program. Wooranna Prep teachers expressed a lack of ownership, but nonetheless they assumed control of their spaces and confidently manipulated them within the rules. Bialik Year 6 teachers’ homeroom ownership was compromised by sharing space with the Hebrew studies teachers. The Year 6 teachers used their resources confidently, but were less successful than their Prep colleagues in creating spaces that suited their own teaching styles within the limits imposed by the Hebrew program. Of all the teaching teams the Wooranna Years 5/6 teachers expressed the lowest level of ownership over their interiors and were the least confident at arranging tools and materials and creating displays. It appears therefore that teachers’ confidence in their design skills, and whether or not they had permission to take ownership of their neighbourhoods, directly influenced the degree to which they assumed responsibility for shaping and managing those spaces.

7.5 CREATING OPPORTUNITIES FOR DIALOGUE

A central theme that emerged in this study was the importance of teachers’ conversations as a mechanism for sharing knowledge about creating, resourcing and using learning spaces to support collaborative learning and teaching practices. Jamieson, Fisher, Gilding, Taylor and Trevitt (2000) stress the significance of informal learning that occurs outside classrooms and lecture theatres in hallways, corridors, playgrounds and cafés. The evidence of the case neighbourhoods was that, like students, teachers learn from their peers in informal situations outside designated professional development sessions. The interview transcripts and photographic data point to key factors that may assist teachers to develop design skills and a store of information about shaping and resourcing venues for learning investigations. These include creating opportunities and developing places for teachers’ frequent and informal conversations, and fostering a culture of conversation within schools that supports teachers’ conversations as part of routine teaching practice.
Wooranna Prep teachers said they continually examined their teaching practices, but expressed their desire for more opportunities for dialogue. Their daily routines meant they had few opportunities for informal conversations. Occasionally they met before school in the target teaching setting to plan specific aspects of their program, but usually they met in a room outside their neighbourhood for weekly planning sessions. In these meetings they worked out how to facilitate the learning investigations they had planned, including what activities would be available in each setting. Wooranna Prep teachers were generally effective in managing their learning settings, but their skills were tested when they tried to respond to externally imposed changes in their working spaces, as evidenced by the introduction of the Nintendo Wii discussed in Chapter 6. Carmel’s attempt to recreate the darkroom in the large-scale construction setting was a unilateral decision rather than a collaborative one. This raises questions about whether a more effective solution could have been found if these teachers had more opportunities for dialogue and conversation.

In contrast Bialik Prep teachers had time and opportunities to discuss all aspects of their teaching practice, including the use and management of their spaces. Together they developed a considerable body of practical knowledge about how their homeroom spaces worked, which helped them develop confidence in organising their spaces and using tools, materials, objects and artefacts to create engaging settings for children’s activities. Art and technology specialist, Anita, explained “there’s a lot of discussion that happens in the [ELC] staffroom… we really use our staffroom… it is a hub for discussion during our breaks and so on”. During recess and lunchtimes teachers engaged in lively discussions, debate and storytelling across a long line of tables strung together in the centre of the room. There was usually something on the table for everyone to share, a celebratory cake, or something baked in the kitchen downstairs. Teachers distributed themselves around the central table to talk and eat, in the kitchen to prepare food and drinks, at the notice board to browse, or at a small table by the window on the far side of the room to read and play chess.

The atmosphere in the teachers’ workroom adjoining the staffroom was similarly congenial. The workroom was a dedicated space for teacher preparation with computer workstations on fixed benches against the walls and a large meeting table in the centre of the room. Teachers used the shared computers to send and receive email, and to prepare teaching materials. The Prep and Year 1 teaching teams used the central table for planning meetings. Prep teacher, Vanessa commented on the convenience of asking her peers for assistance, but what she emphasised most were the opportunities the workroom provided for conversations between Prep and Year 1 teaching teams. Prep teacher, Dawn suggested that the close proximity of the staffroom and teachers’ workroom to the Prep
and Year 1 homerooms made it easy for teachers to use them during their breaks. Implicit in comments by Vanessa’s and Dawn’s is that teachers found it easy to get together and talk.

Wooranna Prep and Years 5/6 teachers used their staffroom less frequently. Principal Bryan explained that “you can go to our staffroom any day and there’s hardly a group of people in there. Just a small number of people... many others are eating their lunch on the job, or that sort of thing”. Not spending time together during breaks meant teachers had fewer opportunities for conversations with their colleagues. The interview data suggest that this situation was compounded by Wooranna’s split timetable, which meant not all teachers took a lunch break at the same time. Had the staffroom been a venue for teachers’ conversations it may have helped to break down the island mentality that Years 5/6 teacher, Rachel, commented on. Rachel’s comment suggests that without a concerted effort to create more opportunities for teachers to share ideas, it was unlikely they would develop the body of shared practical knowledge about the function of their neighbourhoods, which the experience of the Bialik Prep teachers indicates was essential for effectively managing purposefully designed interiors.

Wooranna Years 5/6 teachers, like their Prep colleagues, had weekly planning meetings held in the quiet study upstairs. These conversations centred on the learning and teaching program and student wellbeing. During their interview they reported less emphasis on discussing physical issues as part of their planning process. They also had few opportunities for incidental or informal conversations with their colleagues within their daily schedule. These circumstances combined with teachers’ infrequent use of the staffroom meant that they had little opportunity to discuss ideas or ask questions of other teachers about using their space or creating displays that may have helped them develop confidence in their design skills. The interview transcripts show that every teaching team identified their colleagues as their primary support and source of advice and encouragement, reinforcing the need to create opportunities and places for teachers’ conversations.

Ron Ritchhart, one of the Project Zero researchers reporting on their collaboration with Bialik said: “In order for classrooms to be cultures of thinking for children, schools have to be cultures of thinking for teachers” (Ritchhart, 2009, May). Implicit in the concept of cultures of thinking is dialogue and conversation. Bialik Year 6 teachers identified their conversations with colleagues from across the school community (during Cultures of Thinking study group sessions) as critical to their consideration of how to use and develop their learning spaces. Although their design achievements were modest the
teachers’ efforts were supported and encouraged by their conversations with other teachers and members of Bialik’s leadership team. Their own brief but frequent conversations took place in each other’s homerooms or in the collaborative space. The Years 6 teachers had a well-established dialogue, and the evidence of the Prep neighbourhood was that with appropriate furniture and material resources, they may have been equally successful in creating venues for child-centred, hands-on experiences.

The issues surrounding teachers’ conversations have implications for interior design that may inform the pattern Places for Teachers (5.9.2) proposed in Chapter 5. Teachers in each of the teams had brief informal conversations with their colleagues inside their neighbourhoods. This, together with teachers’ expressed desire for storage to manage documentation and personal resources, suggests the need to consider places for teachers within learning spaces. The effectiveness of the Bialik ELC staffroom and preparation room suggest that creating places where teachers from different teams can exchange ideas is also valuable. The proximity of these rooms to the Prep homerooms seems to be a critical consideration as well. These contradictory positions raise fundamental questions about the purpose of places for teachers and where to locate them, the answers to which will shape the core solution that is yet to be described for the design pattern Places for Teachers (5.9.2).

7.6 MASTERY OF MATERIAL ENVIRONMENTS

The child-centred philosophies and experience-based curriculum being pursued by a growing number of Victorian state school communities, working in new or refurbished BER buildings, require teachers to be skilled managers of their spatial environments. Although these buildings have the potential to be used for a variety of concurrent learning activities, the interior spaces need to be organised into learning settings. What this study has shown is that teachers can develop the design skills to organise space, arrange furniture, select resources and create effective displays. Teachers at Bialik and Wooranna learned these skills through experience, via formal in-service professional development and induction processes, and most importantly from colleagues within their own team and others across the school. They shared ideas and strategies via formal study groups, but more often through informal conversations in their neighbourhood settings and in dedicated meeting rooms.

A critical factor of teachers conversations in relation to the development of design skills appears to be the collegial support that teachers found, and the confidence they gained to have a go and experiment. The contrast between the heavily patronised Bialik ELC staffroom and preparation room, and the under-utilised Wooranna staffroom as places...
for dialogue highlight the important connection between place, time and opportunity. School organisational structures must provide teachers with both time and opportunities for dialogue in order for the places they meet to be effective venues for conversation. All of these aspects of teachers’ conversations, as well as their potential to influence the development of teachers’ design skills and the very real impact those skills may have on their pedagogical practice, suggest that the proposed design pattern, *Places for Teachers* (5.9.2) warrants further consideration. The following chapter returns to a pattern language for school interiors, examining its potential as a tool for translating design innovation into mainstream school interiors, and as a way to document and share teachers’ spatial and material experiments, and encourage and support their design skills.
8.1 LOST IN TRANSLATION

This chapter examines the potential of a pattern language for school interiors as a means of capturing interior design innovation (like that at Bialik and Wooranna) and bringing it into mainstream school design. It argues that in the past only the large architectural design patterns from innovative school designs have been successfully translated into mainstream schools, whereas the smaller interior design patterns have been lost in translation. This chapter also looks at how an interior design pattern language might be used to document the ways that children and teachers are using new spaces, because in the past this ephemeral information has also been lost. It argues that the key to making design innovation available to architects, designers and school communities is to recruit input from teachers already working in innovative environments who can help document how these spaces, places and settings are used for daily school routines. It proposes that the documentation of design patterns and daily routines could play a significant role in establishing and maintaining the critical relationship between pedagogy and design, and may be just what is needed to carry interior design innovation and user experiences into mainstream school design.

In an exploration of the parallels between the school building schemes of the late 1960s and the 1970s and those of today, this chapter begins by tracing the influence of the Medds’ design for Eveline Lowe on the open planning movement in Australia. It examines how the detailed interior design patterns they developed were manifest in Australian school design guidelines and architectural templates. It shows that the Medds’ careful consideration of the needs of children and teachers, which was central to designing from the inside out, was lost in translation. All that remained were top line descriptions that gave no clear indication about how the interior environments of open plan schools should be organised, the appropriate arrangement of furniture to encourage
multiple learning activities taking place simultaneously, or how to select fabrics, furnishings and loose items to articulate the purpose and character of each setting.

Using reports about the effectiveness of open planning in Australia, produced by Angus, Evans and Parkin (1975), and Keating and Zani (1976), it interrogates how open plan schools were used by children and teachers. It argues that given the failure of open planning in Australia, the similarities it shares with the *Building the Education Revolution* program warrant closer consideration. The lessons to be learned from the open planning program are in the day-to-day experiences of children and teachers working in flexible spaces, the economic realities of delivering template school buildings, and the critical function of design guidance for teachers and school communities working in large learning communities. There are also lessons in the similar design patterns produced by both schemes, in particular the rapid return to cellular classrooms at the demise of open planning. All of which highlight the challenges that contemporary architects, designers and school communities face in developing new interior design patterns to shape functional neighbourhood interiors within BER buildings.

Finally, this chapter interrogates the spatial communication strategies developed by Year 2 teachers at Wooranna, arguing that similar techniques may usefully inform the development of a pattern language for school interiors. It examines how the learning documentation practices of teachers at Bialik and Wooranna might provide further information about the interior design patterns identified and documented in Chapter 5. It also explores the opportunities that learning documentation might provide for recruiting the assistance of other school communities, to test the robustness of the design patterns identified by this research as well as helping to identify new ones. A proposal to broaden the focus of learning documentation, is used to argue that it may be possible to develop valuable insights into the ways that children and teachers are using purposefully designed interiors in other schools. This may in turn shed light on the robustness (or otherwise) of the design patterns identified by this research.

8.2 OPEN PLANNING AND THE INFLUENCE OF EVELINE LOWE

During the 1960s and 70s rows of prefabricated, conventional aluminium Bristol classrooms were systematically replaced by open plan environments - characterised by large general learning areas, loose furniture, and moveable internal walls or no internal walls (hence ‘open plan’). Open planning in Australia was accompanied by an informal child-centred approach to learning and teaching advocated by the influential 1967 *Report of the Central Advisory Council for Education (England): Children and their Primary Schools* (Plowden, 1967). Commonly known as *The Plowden Report* this
document was influential both because of its pedagogical content and because it showcased school design trends in the UK and the USA. Included among the design exemplars were Finmere School, 1959, Oxfordshire, England and Eveline Lowe Primary School, 1966, London, England, both designed by David and Mary Medd. The significance of these schools is captured in Schiller’s (1972) reflection that the Medds’ assessment of children’s needs in terms of the kinds of settings they required to do their work, rather than a formulaic allocation of floor space, changed established patterns of thinking about school design.

As an architectural concept, open planning in Australia aimed to facilitate more individualised learning strategies by providing a variety of learning settings for children working in “groups of various sizes… simultaneously engaged in a variety of different tasks” (Angus, Evans & Parkin, 1975, p. 1). This was a significant departure from conventional classrooms that were designed to encourage children to “remain seated in class-size groups attending to a common task for most of the day” (Angus, Evans & Parkin, 1975, p. 1). Of particular interest is how the design patterns developed by the Medds for ‘homes’, ‘enclosed rooms’, ‘general work areas’, ‘specifically committed zones or bays’, and ‘verandah spaces’ were picked up by Australia’s open planning design guidelines and building templates, how they were expressed in open plan interiors, and their influence on Australian education practice.

Eveline Lowe was arguably the single most influential design exemplar to inform open planning design guidelines in Australia via publications including Building Bulletin 47: Eveline Lowe School Appraisal produced by the Department of Education and Science, which ‘presents an assessment of how the building is [was] meeting the educational objectives of the design’ (DfESc, 1972). The bulletin outlines “five fundamental design features” that were adopted by Australian school facilities planners:

1. quiet, partly furnished places for groups of children to work;
2. soundproofed, self contained rooms to accommodate up to a dozen children;
3. general work areas, relatively uncommitted in which furniture could be re-arranged in various ways for unpredictable activities and groupings;
4. bays for particular kinds of work which need special equipment and services; and
5. outdoor covered work areas. (Angus, Evans & Parkin, 1975, p. 2).

These design features corresponded to the Medds’ design patterns for homes, enclosed rooms, general work areas, specifically committed zones or bays, and verandah spaces.
“Capable of limitless interpretation in design” (Medd & Medd, 1972, p. 10), the Medds’ design patterns were intended to provide the starting point for other designers and school communities to use. Their descriptions of each learning setting were vibrant in every design detail including material language, ambience, lighting, and a list of the types of furniture, tools and resources required. The Medds’ descriptions conveyed the humanist sensitivity of the nourishing environments they designed (Burke, 2009) and the care and attention they paid to ensuring that the craftsmanship of every detail reflected these values. A door handle they designed for Finmere School Oxfordshire, 1959, shown in Figure 8.4 for example, is a concrete expression of the careful consideration they gave to human interaction with interior environments (Burke, 2010b; Walker, 2010).

The material warmth and gently tapering form of this timber detail is inviting to hold.

In practice, the detail of the Medds’ designs was lost when they were adopted by the open planning schemes in Australia and their evocative descriptions were reduced to one line statements about spatial function. For example, the Medds’ described homes as places belonging to groups of children:

where they can meet and talk together, amongst things that belong to them and are made by them, making it feel their own…. a comfortable, soft friendly place to be in, with curtains, pictures, flowers, a carpet, window seat, possibly a bed to rest on. (It will certainly be neither large enough nor furnished for everyone to sit at tables and chairs)

(Medd & Medd, 1972, pp. 8-9).

The same pattern is described in Australian open planning design guidelines as “a home base for a class group, where the children could relate to a specific teacher and place in the school” (Keating & Zani, 1976, p. 9).
A significant omission from Australian open planning guidelines was the contribution by school architects and designers, including the Medds, to the development of unconventional environments that, Cullinan (2010) suggests, promoted teachers’ innovative and experimental practice. Missing also were the new ideas of comfort and intimacy, identified by Burke and Grosvenor (2008), in the Medds’ use of furnishings and floor coverings to create tactile and comfortable learning settings. There is little evidence either of the dynamic relationship the Medds created between indoor and outdoor environments, which literally extended the scope of learning settings and metaphorically connected children’s school experience with the wide world. Keating and Zani (1976) note that different colour schemes, textures and materials were used to define particular areas, but do not indicate whether this assisted children and teachers to navigate the new spatial logic of their open plan environments.

Unlike Eveline Lowe, which was designed from the inside out, Australia’s 1970s open plan schools were designed from the outside in leaving the detailed interior design work required to customise open plan template buildings to teachers. Keating and Zani note that open plan schools were provided with more appropriate lightweight and comfortable furniture, including cupboards, trolleys and blackboards. This was intended to facilitate a wide range of activities and could also be easily rearranged to define and divide spaces within the learning area, according to the changing needs of the class (Keating & Zani, 1976, pp. 6-8). Yet Angus, Evans and Parkin (1975) suggest that these new furniture types were used in conventional ways. Reading between the lines, it appears there was no guidance for teachers on how to arrange the furniture or organise open plan spaces to support new ways of learning and teaching. This situation resonates with contemporary experiences of school communities working in new BER template buildings.

8.3 LESSONS FROM OPEN PLANNING FOR THE BER PROGRAM

There are several other similarities between the two schemes, which suggest that open planning may offer insights into the challenges facing school designers who are trying to create flexible school environments and develop new school design patterns. The open plan experience also offers insights into the economic realities of school building reform and the value of professional development for teachers working in new learning environments. The failure of open planning in Australia means that there has been general reluctance to examine the connections between the two programs. Victoria’s DEECD, for example, seeks to distinguish between them, stating that “in contrast to the simple ‘open space’ design of the 1970s, contemporary learning and teaching approaches recognise that active student-centred learning is complex and multi-faceted and requires sophisticated
design principles” (DEECD, 2009c, p. 3). Arguably, the design principles underpinning Australia’s open plan buildings were sophisticated, which makes the lessons they have to offer all the more pertinent.

Angus, Evans and Parkin’s comparative study of open plan and conventional classrooms in Western Australia identified three key reasons why open planning was unsuccessful. Firstly, open plan “schools were not designed specifically to facilitate progressive teaching practices [and] school designers opted for a ‘flexible’ design” (Angus, Evans & Parkin, 1975, p. 33). This meant that open plan interiors could be organised into multiple learning settings, but school communities had to do this themselves. “Secondly, ...school design is a less powerful determinant of teacher behaviour than school organisation and teacher tradition [and] the most logical intents of architects will always succumb to the practicalities of the complex social structure and administration of the school” (Angus, Evans & Parkin, 1975, p. 33). In other words, school architecture was less transformative than anticipated. “Thirdly, ...the differences in design between open plan and conventional classrooms were less real than first imagined” (Angus, Evans & Parkin, 1975, p. 33). This meant the design of open plan learning environments was insufficiently detailed to discourage conventional practice or encourage innovative practice, and conventional classroom practices endured.

8.3.1 Flexibility

‘Flexibility’ was a central tenet of open planning. According to Seaborne (1971, p. 62):

In many places these changes in school design have been accompanied by more flexible methods of internal organization, including the abandonment of the old type of timetable in favour of an ‘integrated day’, the introduction of ‘vertical grouping’ across age ranges and ‘non-streaming’ across ability ranges. The children work in groups of varying size and the teachers work together as a team. Often the groups belonging to one class of forty children work at entirely different activities, and not simply at different aspects of the same subject, which was what had earlier been meant by ‘group work’.

Groups from different classes also intermingle for various activities.

However, Angus, Evans and Parkin (1975) and Keating and Zani (1976) indicate, that teachers did not use open plan environments in flexible ways. Children and teachers tended to occupy a home territory around the blackboard rather than dispersing throughout the space. Also the flexibility offered by specialist facilities integrated into open plan environments was negated when teachers introduced booking systems to use them. Furniture arrangements in open plan schools were relatively static because
teachers tended not to alter the spatial organisation of their environment once it was established. In some schools where teachers had used chairs, tables and trolleys to create multiple learning settings, the general flow of movement was restricted by poor circulation routes within and between learning settings.

Angus, Evans and Parkin’s (1975) report highlights the durability of the design pattern for cellular classrooms and how deeply entrenched were the conventional learning and teaching activities and behaviours, even in open plan environments. They observed that:

> Each teacher in an open plan school was assigned to a learning area that from many points of view was as self-contained as any conventional classroom. While it may lack enclosing walls and have, close at hand, a store room, withdrawal room, wet and quiet areas, the main open plan learning area has comparable dimensions to those of a conventional classroom. Each area is supplied with a blackboard, a teacher’s table, and a desk and chair for each pupil. The class-size group is still very much conceived as a fundamental teaching unit (Angus, Evans & Parkin, 1975, p. 33).

Significantly the report indicates that when school communities persisted with, or returned to conventional education practices, they undid the efforts of open planning school building reform to change the culture of education.

As part of the promise of flexible spaces, both open plan and BER schemes included design patterns for ‘home bases’, ‘general collaborative work’, ‘specialist activities’ and ‘outdoor learning’. In both schemes, home bases are linked with shared learning spaces via operable walls that can be fully opened to create a seamless transition between home base and general learning areas, or fully closed to partition home bases as separate spaces. Some templates also include operable walls between home bases that can be opened to join two home bases. Open plan schemes include “practical areas, withdrawal areas [and] quiet areas” (Keating & Zani, 1976, p. 6) that are mirrored in BER templates by ‘interactive zones’, ‘creative zones’ and ‘reflective zones’ (DEECD, 2008b), and the BER library and resource centres echo open plan schemes where “resource areas were incorporated into the building to accommodate library and teaching aids” (Keating & Zani 1976, p. 6).

Because the BER was a building program its focus was primarily on architectural flexibility. Details about flexible architectural devices, such as operable walls, are included but what flexibility means for the day-to-day management of the interior environments is unclear. In practice the flexibility of BER buildings depends on the capabilities of school communities, especially teachers, to use them in purposeful
ways that exploit their spatial potential. Australia’s experience with open planning suggests that whether or not BER buildings function as flexible learning environments depends on the support teachers are given to develop the spatial flexibility and the educational flexibility of their learning neighbourhoods. This means that the decisions school communities make about the specific spatial requirements of each learning setting, and what facilities and resources might be needed, are critical. School communities may benefit from specialist design assistance.

Furniture arrangements are used to demonstrate flexibility in the BER template drawings, but no concrete guidance is given about how to design the interior environments to facilitate specific learning activities. The drawings and notes about the library and resource centre, for example, outline multiple possible learning activities without specific strategies for creating learning settings to support them. Nor are there guidelines for managing and storing learning and teaching resources, or how to use spatial organisation to ensure compatibility between adjacent learning activities. For example, within the area bounded by the blue ring in Figure 8.5 is a project space enclosed by a curtain. The curtain is unlikely to provide an effective sound barrier between the project space and the rest of the neighbourhood. Careful consideration is required for the activities conducted in the project space and the settings located nearby. Arguably, if schools are going to design their own interiors they need support from research and the experience of others to help them plan effectively.

**Figure 8.2 - BER Project/ Dark Space, Curtain for Enclosure**

Floor plan prepared by Hayball and Grey Puksand (DEECD, 2009h, p. 4)
Another example of mixed messages can be found in the sketched arrangements of tables and chairs included in the design templates for BER buildings (DEECD, 2009f, 2009g, 2009h). These suggest a break away from ‘the teacher’s desk at the front of the room’, as demonstrated by the illustration on the left in Figure 8.6. However, as the floor plan on the right illustrates, digital technologies influence spatial organisation by encouraging teachers to shape their home bases by orienting clusters of tables and chairs towards electronic whiteboards, which continue to define the front of the room. It is worrying that these furniture arrangements visualise and support the structure of class groups, and reinforce the home base/classroom as the design pattern most closely connected to learning experience. For educational change to occur, it is arguable that school communities working in new BER buildings need access to interior design patterns that they can use to shape spatial alternatives to conventional classrooms.

8.3.2 Economic Realities

Little reference is made to the economic realities of delivering 1970s school building reforms in Australia, but Smith (1974) links economics to watering down school design features, which compromised the performance of open plan schools in the UK. He suggests that the use of cheaper materials resulted in resonant surfaces and the amplification of noise, and that reduced space allocations motivated by economics limited spatial organisation. Smith also suggests that inadequate window covering resulted in solar glare on work surfaces, which limited where children could work and in some cases made film and television presentations difficult to facilitate. Despite design guidelines to the contrary, in some schools no acoustically separate spaces were provided to isolate quiet or noisy activities. As a result new open plan environments noisy and difficult to manage increasing the challenge faced by teachers seeking to break with conventional practice.
Anecdotally, cost cutting measures have also affected the construction of contemporary Australian learning neighbourhoods and negatively impacted on the introduction of new education programs. During an informal conversation at a school design conference, one teacher explained that an integrated curriculum and collaborative learning program for Year 9 children was abandoned because the acoustic design features of the new building were omitted during construction - to save money. The teachers had imagined a holistically designed learning neighbourhood, where children would work in home groups for explicit teaching and smaller collaborative groups of various sizes for all other activities. While this particular learning neighbourhood was not a BER building, it conformed to the same design patterns of multiple home bases opening onto a shared community space. The teacher relating this story was concerned that the efforts she and her colleagues were making to change learning and teaching practices were thwarted by the acoustic limitations of the new building. Worse still they had no alternative but to return to teaching in their separate home bases. This anecdote is hauntingly reminiscent of the post occupancy reports on open plan schools in Australia (Angus, Evans & Parkin, 1975; Keating & Zani, 1976) where the same issues of noise and unworkable spaces were reported.

This research is also interested in the economic realities of conducting school design research and what opportunities might exist to establish ongoing informal research projects that may be less susceptible to changing political agendas. Short-term research projects, such as DEECD’s Next Practice Program, that focused on innovative education and design practice were consumed by the nation-building and transformation agendas of the BER. The lessons that might have been learned were lost. In particular, this research is interested in how to continue researching and developing the interior design patterns documented in Chapter 5, so that the design innovations made at Bialik and Wooranna can assist school communities to develop alternative interiors to support and promote pedagogical change. This chapter later examines the potential of a pattern language for school interiors for ongoing documentation of the ways that children and teachers are using innovatively designed school interiors, to make those design patterns available for use by other architects, designers and school communities.

8.3.3 Special Training for Teachers
Keating and Zani (1976) suggest that the lack of consistent and ongoing professional development for teachers working in Australian open plan schools contributed to the persistence of conventional classroom practices and the eventual demise of the open plan school. Angus, Evans and Parkin (1975) claim that teachers experienced a loss
of independence and autonomy as they negotiated the challenges of working in teaching teams. They perceived that education expectations had changed but they had little guidance of what to do in the new spaces. Teachers opted to close operable walls where possible, and children and teachers tended to gravitate towards enclosed areas within open plan schools, away from visual and acoustic distractions. Keating and Zani also note that the lack of professional development for teachers directly influenced their inability to exploit the flexibility of open plan schools.

The argument for providing teachers with ongoing support and professional development is further strengthened by the positive experiences, reported by Keating and Zani, of South Australian teachers working in open plan schools. In South Australia a team of ‘open area (plan) consultants’ visited individual schools and conducted one-week residential in-service education programs for teachers within their own school. Teachers in South Australia chose to apply for appointment to open plan schools, and the South Australian Education Department’s strategy of adding open plan units to existing schools meant that teachers could observe them operating in their own schools. In other states school education programs were not clearly defined, so there were few “effectively operating ‘model’ open plan schools” (Keating & Zani, 1976, p. 42), and teachers were obliged to adapt to whatever learning environments were at their own schools.

The Victorian DEECD has been proactive in providing teachers with professional development, but more can be done to prepare and support school communities working in BER buildings by engaging them in an ongoing and collaborative design process. Prior to the completion of BER school buildings, DEECD hosted several conferences and seminars on innovative learning environments and facilitated a number of mentoring programs between school communities working to change learning cultures and physical environments (Atkin, 2010, July; Dobbs, 2010, August). These initiatives demonstrate commitment to “professional learning to support the effective use of the new environment and the linkage between pedagogy and space [which] is an essential part of the change process” (DEECD, 2008b, p. 12). The concern is that once school communities move into new school buildings they will no longer have the appropriate design support to exploit the potential of their new learning environments.
8.4 CREATING EFFECTIVE FEEDBACK LOOPS

As discussed in Chapter 1 a great deal of attention has been given to the need to develop shared understandings between designers and school communities to facilitate design collaboration and encourage community engagement in school design projects. Arguably there is an equal, if not greater, need to develop a common design language so that school architects and interior designers can learn from school communities how new school buildings are functioning, and how children and teachers are using and inhabiting new interiors. For this study the possibility of establishing effective feedback loops between the school communities who are working in purposefully designed learning spaces, places and settings, and the architects and designers responsible for their design, is critically important. As this research has shown, we are just beginning to understand how new learning environments are being used by school communities and what their possible influence on learning and teaching practices might be. Greater understanding might be achieved by developing teachers’ existing communication strategies, and creating opportunities for them to share their practical experiences with one another and with architects and designers.

8.4.1 Teachers’ Spatial Communication Strategies

![Diagram of Subject Centres]

**Figure 8.4 - Subject Centres**
Spatial organisation and furniture selection made by Wooranna Year 2 teachers.

At Wooranna, three Year 2 teachers developed strategies to plan, discuss and design their learning environment that provide useful insights into how to bridge the communication gap that Lackney (2009) suggests exists between designers and educators. The Year 2
space was developed as a venue for children to conduct Reggio-style learning investigations, such as *The Puppet Project*, which informed Featherston’s work on the *Inside-Out Project*. For Featherston the Year 2 *Puppet Project* was proof that children can conduct rich and complex learning investigations in primary schools. The Year 2 teachers were encouraged by Principals Bryan and Louise to be adventurous with their teaching practice including the way they used their large converted space. Former Year 2 teacher, Carla explained that they wanted children to work in small collaborative groups. They also wanted to integrate curriculum content into learning investigations. So their design process centred on creating a collection of discrete learning settings conceived as subject centres for maths, language, and art, plus areas for construction and explicit teaching, see Figure 8.7.

Lackney’s assertion that “educators lack a common language for expressing their experience of school and for articulating their environmental concerns with reference to the activities of teaching and learning” (Lackney, 2008, p. 134) is contradicted by the spatial communication strategy developed by the Year 2 teachers. Carla was actually trained in interior design, including the practice of using paper representations of furniture to aid spatial organisation of an architectural plan (Mitton, 2004). The teachers adopted this strategy to facilitate a conversation about what learning and teaching would look like in their interior environment. They compiled an inventory of the available furniture and cut out shapes corresponding to the scale and footprint of each piece they wanted to use. On some shapes they drew pictograms, as demonstrated in Figure 8.8, to identify which piece of furniture the shape represented. They arranged the furniture shapes on the
floor plan, fixing them in place with Blu Tack, as they mapped out the learning settings and discussed how many children would be working in each subject centre and what activities they would be doing.

Through the initiatives of this research, the Year 2 teachers’ strategies for spatial communication and design have been used in workshops for communities and design professionals, and influenced the development of the design resource Learning Furniture: A Don’t Just Stuff-It Guide (Cleveland, Frith & Woodman, 2010), produced and distributed by CEFPI Australasia. The kit includes furniture cutouts and a DVD video presentation that guides users through the process of designing learning settings and environments from the inside out (Featherston, 2006). Informed by Featherston’s design process, the video presentation poses three series of questions formulated to direct conversations about what elements are necessary in the physical learning environment to support collaborative learning and teaching practices. The first series of questions are about learning experiences, the second are about the immediate physical learning environment, and the third are about the wider physical environment. Informal feedback from teachers at the conclusion of the workshop held to trial the design resource (shown in Figure 8.9) indicated they were empowered to contribute to the design conversation.

8.4.2 Graphic Tools for Spatial Communication

The Year 2 teachers’ spatial communication strategy also influenced this research project’s development of graphic tools to help locate teachers’ daily practice within their interior environment. The teachers’ addition of pictograms on some of the furniture shapes was particularly influential - it added an element of figurative illustration to an otherwise abstract visual representation of the neighbourhood interior. It also brought a third dimension to the two dimensional plan. This suggests that combining more than one visual perspective may be an effective aid for non-designers, who are not necessarily literate in spatial communication (Comber et al., 2006), to make sense of plan drawings. As has been discussed in previous chapters, the teachers working in the case neighbourhoods at Bialik and Wooranna who were effective in maintaining and enriching their interiors regularly included the physical environment in their discussions about teaching practice. So the aim was to create visual representations that would help draw the physical context for learning activity into pedagogical conversations about learning and teaching practice.
The graphic tools presented in Figure 8.7 are designed to bring the physical learning environment into pedagogical discussions by locating illustrations of children’s learning experiences within a floor plan. Wooranna Year 6 student Jason is shown in the different learning modes exhibited by children working in the quiet study upstairs in the Years 5/6 neighbourhood. In illustration ‘A’ he is working at a desktop computer doing online research or word processing. In illustration ‘B’ he is working at a table making notes or doing writing composition. This is also where he studies with his peers. Illustration ‘C’ shows him sitting in a beanbag reading for pleasure. Unlike other modes of three-dimensional representation, such as a computer generated fly through, this combination of illustrations and plan drawing is a way of condensing visual information, as described by Tufte (2001), to illuminate connections between the familiar figurative form of illustrations and the less familiar abstract form of plan drawings.

Combining visual information in this way may make architectural plans more meaningful because they locate children’s activities within the physical settings where they occur, however these tools are for communicating information rather than collecting it. Such visual representations make it possible to show the particular activities children
at were engaged in, their interactions with the physical and material environments, the
different working postures they assumed, and their various learning relationships, but
more first-hand evidence about all of these is needed. Teachers document each of these
things incidentally as they record children’s learning processes, therefore broadening the
focus of teachers’ learning documentation to include the physical context for the learning
activities may provide the first-hand evidence required. Arguably the same evidence would
also contribute to documenting a pattern language for school interiors.

8.4.3 Learning Documentation

Typically learning documentation does not include the physical environment, but it could,
which may to help illuminate the link between learning activity and its physical context.
Currently the focus of learning documentation is too narrow to shed light on that link,
as exemplified by the detailed documentation the Wooranna Year 2 teachers made of
The Puppet Project, which makes only incidental reference to the physical learning
environment the teachers created. Their photographs document children’s learning
experiences, the collaborative nature of their learning relationships and the various
sized groups they worked in. They also record the kinds of tools, materials, technologies,
facilities and resources children used, all of which are evidence that the teachers managed
and maintained a rich material environment. However the photographs tightly frame
their child subjects excluding the surrounding environment, and the examples teachers
collected of children’s work are disconnected from the settings in which they were created.
Likewise teachers’ written records do not indicate where children’s conversations took
place or how they were interacting with those spaces at the time.

Teachers are in a unique position to capture learning experiences in the physical settings
where they occur, which may contribute to a better understanding of the design patterns
for learning settings and learning neighbourhoods. Strategies for widening the focus
of learning documentation might include annotating children’s conversations and work
samples to indicate where they took place, or where they were made. Another strategy
might be to include wide shot photographs to establish the physical context for learning
activities in addition to the tightly framed photographs teachers already take. This kind
of learning documentation could add detail to emerging interior design patterns, or point
to missing design patterns or patterns that require revision. It may also help to confirm
the integrity and robustness of individual design patterns, for example, the Bialik Prep
mini-studios that are included in the design pattern Studio Lab (5.8.9). Teachers’ learning
documentation could be used to assess whether mini-studios are different interpretations
of the same pattern as Wooranna’s studio labs or if they are two separate patterns.
Involving school communities in documenting a pattern language for school interiors presents an opportunity to establish effective feedback loops between school communities, planners and design professionals. In particular, teachers’ observations of their interior environments may influence future developments. For example, Wooranna Prep teacher, Carmel’s observation that children lowered their voices when they entered the learning settings beneath the suspended fabric canopy was not documented prior to this research. Together with the Wooranna Prep and Years 5/6 teachers concerns about the ambient noise levels in their learning neighbourhoods, Carmel’s observation provides the basis of a possible acoustic design solution that could be tested, using quantitative methods, to formally assess the relationship between ceiling height and speech volume. The same studies could be used to establish the robustness of the design pattern for Low Ceiling, High Ceiling (5.6.2). This is an example of an effective feedback loop, when as Sanoff (2008) suggests, design practice is learning from user experience.

8.5 A COMMON DESIGN LANGUAGE
The creation of a common design language is implicit in the proposal of a pattern language for school interiors as a resource for translating localised design innovation into mainstream school design. The intention of a common design language is to facilitate clear communication between design professionals and school communities enabling them to develop more effective design briefs for better functioning school interiors. A pattern language for school interiors may also facilitate ongoing collaboration by providing a feedback loop between school communities and design professionals. Arguably this was what was missing when open plan schools were introduced. School communities were left to develop their own school interiors when the evidence of the design innovations that inspired open plan school design, including the Medds’ design for Eveline Lowe, was that close attention to every detail of children’s and teachers’ needs was required to produce rich and engaging environments for experience-based learning. The lessons from the open plan era suggest that if today’s educational change objectives are to be achieved, emphasis needs to be placed on the co-contribution of designers and educators to a common design language.

What is clear from Australia’s open planning scheme and from teachers’ contemporary experiences working in BER buildings, is that school communities are seeking assistance to develop functional interior environments within new and newly refurbished school buildings. The challenge highlighted by open planning in Australia is how to effectively translate innovative design solutions, like the interiors Featherston designed at Bialik and Wooranna, into mainstream school design. As this chapter has argued one logical solution is to document the design patterns identified in purposefully designed interiors
and present them as a pattern language to help other school communities shape their own environments. Making detailed interior design patterns accessible to school communities, architects and designers may also make them less susceptible to being lost in translation as the Medds design patterns were when they were picked up in Australia. Hopefully teachers’ involvement in contributing to the design patterns will help create a sense of ownership, as well as establishing a formal mechanism for ongoing design feedback from users.

The documentation of a pattern language for school interiors aims to make it accessible to non-designers, especially teachers, as well as architects and designers. Encouraging and incorporating teachers’ spatial communication strategies may reduce communication barriers by making the design patterns accessible to all involved. Recruiting school communities as contributors to a pattern language may also help test the robustness of design, using an already established practice of learning documentation.

Recording teachers’ professional observations may facilitate building a store of knowledge about how to create and use new kinds of learning settings for all school communities to share. This could be an effective way to establish a framework for developing teachers’ awareness of the role of the physical environment in learning experience. It may also help draw teachers’ attention to their growing capabilities to exploit the physical environment to suit their pedagogical aims. Questions about the most effective ways to gather, store and share teachers’ insights about the physical context of their professional practice could be the subject of future research.
9.1 THE ROLE OF INTERIOR DESIGN IN CULTURAL CHANGE

The aim of this research has been to discover what role interior design can play in changing the culture of learning in primary school learning neighbourhoods by investigating four learning environments specifically designed to support new modes of learning and teaching. The Prep and Year 6 neighbourhoods at Bialik College and the Prep and Years 5/6 neighbourhoods at Wooranna Park Primary School were studied as examples of school interiors purposefully designed to facilitate a shift away from teacher-led instruction towards collaborative, experience-based learning - widely acknowledged as exemplars of innovation in pedagogy and design. The research investigation revealed the potential of interior design to promote new modes of learning and teaching by communicating to children and teachers, via environmental cues embedded in the spatial organisation, arrangement of furniture and presentation of the neighbourhoods, the kinds of hands-on activities, co-operative behaviours and democratic relationships appropriate to collaborative and child-centred cultures of learning. It also showed that when learning and teaching practices contradicted the functional and pedagogical aims of the interiors, when the environmental cues were ambiguous, and when the designed potential of the physical environment was not realised by the users, the neighbourhood environments were less supportive of learning and teaching activities than intended by their design.

The research findings highlight the significant role Featherston played by establishing environmental communication within the Bialik Prep neighbourhood and the Wooranna Prep and Years 5/6 neighbourhoods. Equally significant was the design role the school communities, particularly teachers, played in managing and building upon that communication to develop a conversation about learning with children, and to maintain the alignment between the design of the interiors and the learning and teaching cultures.
they were designed to support. The research findings suggest that the ideal relationship between designer and users is a design partnership. The designer invests the interiors with functional and pedagogical potential, and relies on teachers to manage and manipulate the learning environments to realise their potential (as the third teacher) to support daily school routines and create opportunities for investigation and discovery. The research findings also suggest that teachers are uniquely placed to capture learning experiences in the places and spaces where they occur, which may contribute to a better understanding of how children and teachers use and inhabit their neighbourhood environments, and help test the robustness of the interior design patterns identified and documented by this research.

The aim of identifying and documenting a pattern language for school interiors was to make the design innovations achieved by Featherston and the school communities at Bialik and Wooranna available for other school communities, planners, architects and designers to plan, design and fit-out new and refurbished collaborative learning environments. The research investigation confirmed the need to make the interior design patterns identified at Bialik and Wooranna accessible. As shown by the example of the collaborative space in the corridor of the Bialik Year 6 neighbourhood, school communities need access to the small interior design patterns required to define settings and shape purposeful learning environments. Equally, as demonstrated by the Medds’ design for Eveline Lowe Primary School and its subsequent influence on open planning in Australia, interior design patterns are implied in the successful translation of innovative design solutions (like the interiors Featherston designed at Bialik and Wooranna) into mainstream school design.

9.2 RESEARCH OUTCOMES AND OTHER APPLICATIONS

The outcomes of this research include a new research methodology for studying the role of interior design in cultural change, and graphic tools to help articulate the connection between learning and teaching activities and their physical contexts, and communicate how interior environments function. The other outcome of this research is an emerging pattern language for school interiors that may be useful to establish a feedback loop between users and school designers, and to further develop, formalise and expand the study of school learning environments. The long-term aims of this study are to develop the research methodology and the pattern language further as aids to creating more effective design briefs for better functioning schools. The products of this research may also have broader application for interior design research in other contexts, namely the role of interior design in changing the culture of work in business environments.
While the aim of documenting a pattern language for school interiors was to make Featherston’s design innovations at Bialik and Wooranna available to other school communities, its potential to provide an effective feedback loop between users and designers is equally significant. As this study has shown, the experiences of teachers working in collaborative environments, like those at Bialik and Wooranna, offer valuable insights for school design practice if they can be communicated effectively to architects, designers, policy makers and school planners. As the discussion in Chapter 8 suggests there is potential to receive contributions to a pattern language from teachers in the form of learning documentation. It is likely that broadening the current focus of teachers’ documentation practices to include the physical learning environment will further illuminate the relationship between learning and teaching activities and the venues where they take place. It is also likely that the graphic tools developed for this research investigation, inspired by teachers’ visual communication strategies, will have a part to play in the future development of a pattern language for school interiors.

The purpose of the research methodology developed for this investigation was to study what contribution interior design can make to changing the culture of learning, by comparing children’s and teachers’ patterns of activity and behaviour observed in particular learning environments with desirable behavioural patterns nominated by the school communities as indicative of new modes of learning and teaching consistent with cultural change. In this study the various documents that constituted the design briefs for the interiors Featherston designed at Bialik and Wooranna, referred to as archival documents, were used to establish the desirable behavioural patterns at each school. Children’s and teachers’ actual patterns of activity and behaviour were identified by plotting and studying photographic data generated using an automated observation system and a hand-held camera. The patterns identified were interrogated against the archival documents with the assistance of data from semi-structured interviews conducted with Featherston, the school leaders and the teaching teams. The significance of this research methodology is that it enables the study and assessment of complex interiors as total systems.

In April 2014 the research methodology for this study was presented at the agIdeas Design for Business Research Conference in Melbourne as a strategy for studying the influence of workplace interior design on the development of collaborative work cultures in a knowledge economy (Myerson, 2004). The strong parallels between the cultural changes taking place in Australian education and in Australian business resonated with the business community. Anecdotal evidence from informal conversations with members
of the audience indicates that although there has been significant financial and design investment in developing new work environments to encourage collaborative work practices, the new environments are not being used as designed and workplace relationships are suffering as a result. This research methodology could be used to discover whether this is the case and if so, why. A preliminary examination of this field of research confirms anecdotal concerns about collaborative workplaces, suggesting that there is definite need for this work to be done (Frith, 2014).

9.3 NEXT STEPS

Although the potential of researching other kinds of interior environments and their influence on cultural change is indicated, my interest is in developing the research methodology and pattern language as diagnostic and communication tools to help assess existing learning environments and plan interior refurbishments and fit-outs. I am particularly interested in the potential of this methodology to track the process of cultural change before, during and after design processes to fit out or refurbish new and existing school buildings. Initial discussions with a handful of Victorian schools suggest there is interest within school communities in being involved in interior design and research processes, and in particular in being able to assess the influence of school interior design on learning and teaching practices over time. The possibility of recruiting teachers at these schools to assist in documenting the physical context surrounding learning activities is also indicated.

As discussed in Chapter 2, the Bialik and Wooranna school communities were well advanced in their pedagogical developments and, with the exception of the Bialik Year 6 neighbourhood, children and teachers were working in interior environments that had already been designed. Therefore it would be interesting to apply the research methodology and pattern language to an open-ended study commencing with the assessment, and continuing (with the assistance of teachers) to track the experiences of children and teachers in relation to their physical learning environment well after the formal design process is complete. Such an investigation would undoubtedly provide valuable insights into where, when and what kinds of support teachers need to help them develop the design skills to maintain and grow rich, engaging and inspiring learning environments.

Australian Curriculum Assessment and Reporting Authority. (2010). *My School* [website].
http://www.myschool.edu.au/


Angus, M., Evans, K. & Parkin, B. (1975). *Australian open area schools project, technical report no. 4: an observation study of selected pupil and teacher behaviour in open plan and conventional design classrooms*. Perth, Australia: Education Department of Western Australia.


Ernesto Balducci Pre-school. (n.d.). *My nose is as full as a world.* Reggio Emilia, Italy: Author.


All conditions pertaining to the human research ethics clearance granted by the Swinburne University Human Research Ethics Committee (SUHREC) for Project 0708/179—*The School: Designing a dynamic venue for the new knowledge environment* (see Appendix A & Appendix B) were properly met.

Both an annual report and a final report were submitted to the SUHREC (see Appendix C for reference to the annual report, please note that no receipt was issued for the final report).

Permission was sought from and granted by the Victorian Department of Education and Early Childhood Development (DEECD) to conduct research in Victorian Government schools (Wooranna Park Primary School). The amendments to consent instruments requested by the SUHREC were also forwarded to DEECD for approval (see Appendix D).

A *Working with Children Check* was completed by research candidate Kellee Frith who conducted all of the neighbourhood observations at Bialik College and Wooranna Park Primary School (see Appendix E).
From: Keith Wilkins  KWilkins@groupwise.swin.edu.au
Subject: SUHREC Project 0708/179 Ethical Review
Date: 14 April 2008 2:16 pm
To: Deirdre Barron DBarron@groupwise.swin.edu.au, Denise Whitehouse DWhitehouse@groupwise.swin.edu.au, Kellee Frith KFrith@groupwise.swin.edu.au

To: Dr Denise Whitehouse/Dr Deirdre Barron/Ms Kellee Frith, Design

Dear Denise, Deirdre and Kellee

SUHREC Project 0708/179 The School: Designing a dynamic venue for the new knowledge environment
Dr D Whitehouse, Dr Deirdre Barron, Ms Kellee Frith, Design
Proposed Duration: 07/04/2008 To 31/12/2008

Ethical review of the above project protocol was undertaken by Swinburne's Human Research Ethics Committee (SUHREC) at its Meeting 2/2008 held 4 April 2008, the outcome of which as follows.

Approved subject to the following addressed to the Chair's (or delegate's) satisfaction:

1. Clarification needed as to who will be video-taping the children and their compliance with privacy requirements.
2. Clarification needed as to industry partner and any commercial benefits to be had and to whom - which information may also need to be disclosed on the consent statements.
3. Sets of consent instruments to be clearly labelled/cross-referenced (exactly which particular statement related to which particular form).
4. Consent info statements to be revisited in light of the above and for plainer effect, especially consent statement for parents which appears to need revision.
5. Consent forms: 3(a) on side effects where there are none and facility for witnesses need to be deleted. Also, clarification is needed as regards the need for keeping (f) on the consent form. But currently no (e) - is there any missing text?
Forms to be renumbered accordingly.

To enable further ethical review/finalise clearance, please would you respond to the above items (by direct email reply if preferred), attaching any revised consent instruments in light of the above. A full revised ethics clearance application is not required and should not be sent; missing, additional or revised text from the application can be incorporated into your response. Please also note that human research activity (including active participant recruitment) cannot commence before proper ethics clearance is given in writing.

Please contact me if you have any queries about the ethical review process undertaken. The SUHREC project number should be quoted in communication.

Yours sincerely

Keith Wilkins
Secretary, SUHREC

--------------------------------------------------------------------------------

Keith Wilkins
Research Ethics Officer
Swinburne Research (H68)
Swinburne University of Technology
P O Box 218
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Please consider the environment before printing this email.
From: Keith Wilkins  KWilkins@groupwise.swin.edu.au
Subject: SUHREC Project 0708/179 Ethics Clearance
Date: 28 May 2008 3:59 pm
To: Deirdre Barron  DBarron@groupwise.swin.edu.au, Denise Whitehouse  DWhitehouse@groupwise.swin.edu.au, Kellee Frith  KFrith@groupwise.swin.edu.au
Cc: Silvana Ferlazzo  SFERLAZZO@groupwise.swin.edu.au

To: Dr Denise Whitehouse/Dr Deirdre Barron/Ms Kellee Frith, Design

Dear Denise, Deirdre and Kellee

SUHREC Project 0708/179 The School: Designing a dynamic venue for the new knowledge environment
Dr D Whitehouse, Dr Deirdre Barron, Ms Kellee Frith, Design
Approved Duration: 28/05/2008 To 31/12/2008

I refer to the ethical review of the above project protocol undertaken by Swinburne's Human Research Ethics Committee (SUHREC). Your responses to the review as emailed on 12 and 13 May 2008, including revised consent instruments, were put to a delegate of SUHREC for consideration. I also acknowledge receipt of evidence of authority to undertake the research in Victorian Government schools.

I am pleased to advise that the project (as submitted to date) has approval to commence in line with standard on-going ethics clearance conditions here outlined.

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the National Statement on Ethical Conduct in Human Research and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.

- A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact me if you have any queries about on-going ethics clearance. The SUHREC project number should be quoted in communication.

Best wishes for the project.

Yours sincerely

Keith Wilkins
Secretary, SUHREC

*******************************************

Keith Wilkins
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Please consider the environment before printing this email.
To: Dr Denise Whitehouse/Dr Deirdre Barron/Ms Kellee Frith, Design

Dear Denise, Deirdre and Kellee

SUHREC Project 0708/179 The School: Designing a dynamic venue for the new knowledge environment
Dr D Whitehouse, Dr Deirdre Barron, Ms Kellee Frith, Design et al
Approved Duration Extended to 30/06/2009 [Project Modified February 2009]

Thank you for the progress report for the above project which included a request to adjust duration and to cover a modification to the protocol re student participation arrangements and information being put to participants. The report and request was submitted in hardcopy form dated 2 February 2009 (with attachments) and put to the Chair of SUHREC for consideration.

I am pleased to advise that, as submitted to date, the modified/extended project has clearance to proceed in line with ethics clearance conditions previously communicated and reprinted below.

Please contact me if you have any queries about on-going ethics clearance and if you need a signed ethics clearance certificate. The SUHREC project number should be quoted in communication.

Best wishes for the continuing project.

Yours sincerely

Keith Wilkins
Secretary SUHREC

*******************************************
From: Warne, Christine P  Warne.Christine.P@edumail.vic.gov.au
Subject: Appn: SOS003828
Date: 2 June 2008 9:24 am
To: Kellee Frith  kellee.frith@ozemail.com.au
Cc: Dowling, Andrew L  dowling.andrew.l@edumail.vic.gov.au

Kellee
Thank you for providing the amendments requested by the Swinburne University HREC to your application to conduct research in schools titled: ‘The School: Designing a dynamic venue for the new knowledge environment’.

The Department of Education and Early Childhood Development approves the amendments subject to the conditions outlined in the original letter of approval.

Regards
Chris Warne
Research Branch
Education Policy and Research Division
Ph: (03) 9637 2272
warne.christine.p@edumail.vic.gov.au

-----Original Message-----
From: Kellee Frith [mailto:kellee.frith@ozemail.com.au]
Sent: Friday, 30 May 2008 4:00 PM
To: Warne, Christine P
Cc: Denise Whitehouse; Deirdre Barron
Subject: Application SOS003828

Dear Christine,

Please find attached revised consent instruments for the research project with application code: SOS003828. The wording of some aspects of the consent instruments has been altered for greater clarity at the request of Swinburne University's Human Research Ethics Committee.

The research project remains otherwise unchanged and has now been approved by the SUHREC.

Kind Regards,

Kellee Frith
Master of Design Research Student
Swinburne University of Technology

on behalf of
Dr Denise Whitehouse
Chief Investigator & Co-ordinating Supervisor
Swinburne University of Technology

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Department of Justice

Working with Children Check Unit

ATTENTION: HR MANAGER
KELLEE FRITH
22 BROOKE STREET
NORTHCOTE VIC 3070

THIS IS TO ADVISE YOU THAT A WORKING WITH CHILDREN CHECK ASSESSMENT NOTICE IS ISSUED UNDER THE Working with Children Act 2005, to

Kellie J Frith
Date of Birth: 13-03-1973
Copy of Working with Children Check Card Number: 0120616-01

This Card is valid for five years unless sooner revoked under Section 23 or surrendered under Section 24 of the Working with Children Act 2005. A Card may be revoked if ongoing monitoring reveals the card holder has been charged with, or convicted of, a criminal offence.

Employers and Agencies have the following administrative obligations and responsibilities:

- Make sure all your employees or volunteers who are required to have a WWC Check have submitted an application by the due date and have passed the Check.
- Sight the employee or volunteer’s WWC Check Card and record (including their name and card number) that they have passed WWC Check.
- Respect the cardholder’s confidentiality and privacy.
- Regularly check the status of the employee or volunteer’s WWC Check – using the name and number of the employee or volunteer.
- Encourage cardholders to notify the Department of Justice of changes to their contact details.
- When employing staff to undertake child-related work, advise existing cardholders (who passed check before being employed by you), that they must notify DoJ within 21 days of joining your employer.

Cardholders can update their details, and Employers and Agencies can check the status of person’s card, online at http://www.justice.vic.gov.au/wccu. or, phone the Information Line on 1300 652 879 between 8.30am-9pm Monday-Friday.

Fiona Chamberlain
Director, Working With Children Check Unit
Department of Justice, Victoria


