

An investigation into the curriculum-related decision making of schools with new, or redeveloped learning spaces, with a particular emphasis on pedagogy and school organisation theory.

PRINCIPAL SABBATICAL REPORT

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EXECUTIVE SUMMARY

This investigation explores the link between school pedagogy and innovative school building design.

Findings detailed within this study are based on observations and interviews conducted in 12 New Zealand schools and three schools in Singapore. All schools were either planning for, or had recently completed, major property construction or redevelopment projects.

Interviews with principals and teachers suggested that although new buildings can be the catalyst for revised pedagogy, many schools find the transition to new facilities encourages and reinforces pedagogies already planned for, or adopted. In addition, it was clear that in cases where school leaders and teachers had a high level of control over school design, pedagogical considerations remained at the very heart of the project throughout the design and construction period.

Based on interviews with both principals and teachers, it is clear that while innovative buildings do not determine or lead pedagogy, purpose-designed buildings have a strong tendency to reinforce and facilitate school-wide consistency in teaching and learning.

PURPOSE

To investigate the curriculum-related decision making of schools that have taken possession of new, or redeveloped learning spaces, with a particular emphasis on pedagogy and school organisation theory.

This investigation was prompted by a major building redevelopment undertaken at St Clair School during 2010, and set out to explore the notion that school property design influences and shapes the pedagogical approach adopted by a school.

INQUIRY BACKGROUND

As is the case in many New Zealand schools, buildings at St Clair School are the result of several phases of construction. The original school, founded in the 1890s, was a solid, linear brick structure housing numerous classrooms linked by a single corridor. The school was functional and sat comfortably within the design expectations of the period.

In the mid 1970s, under pressure to extensively modernise the school or replace it completely, the Otago Education Board commissioned a new 2-storied school for the site. The design of the new building was again typical of the period – timber framed, fibrolite clad and chip-board lined. It also reflected educational thinking of the period; isolated classrooms, functional cloak areas and narrow connecting corridors. Issues such as lighting, ventilation, heating and acoustics were given only limited consideration and the design largely reflected the education mindset of the era – *one room, one class, one teacher, one learning style*.

The opportunity to undertake redevelopment work at St Clair School and address some of the shortcomings of the facility was made possible by the recognition of long-standing roll-related space deficiency with an associated revised building area entitlement, along with the government's 1:18, and subsequently 1:15, junior class ratio policy.

In considering options for the school the Board and staff recognised that any decisions relating to changes to the existing buildings needed to reflect educational thinking relating to learning styles and learning conditions, as well as collaborative and cooperative learning philosophies. There was also recognition that whatever was done must be flexible, and to some degree, allow for the ongoing 'evolutionary' changes that will inevitably occur in the future.

Once the initial design parameters were established with stake holders, teachers and school leaders discussed in greater detail the opportunities presented and noted the challenges ahead.

Opportunities identified included:

- Greater connectedness for children and adults
- Increased transparency of practice
- Enhance physical proximity
- Easier movement between learning spaces
- Possibility for variable learning spaces
- Opportunities for children to work and interact independently.

Challenges identified included:

- Increased transparency of practice
- Increased physical proximity
- Potential for disruption through visual and acoustic intrusion
- Increased need for high-level collaboration in regard to use of shared-space.

Following a nine month building process and two terms of intensive use, feedback from teachers, parents and children suggests that the school has maximized the opportunities presented and met the challenges directly and positively. The school's redeveloped property has become a key feature of the school with strong links to school-wide learning theory and a clarity of purpose at its heart.

SABBATICAL COMPONENTS

This sabbatical investigation included three major components:

- Professional reading
- Professional visits to 10 geographically diverse New Zealand schools including new schools, redeveloped schools and schools engaged in the initial planning process
- Professional visits to three schools in Singapore.

PROFESSIONAL READING

Increasingly, educationalists and academics are taking a greater interest in the link between building form and function within education. Many of New Zealand's schools, especially those constructed between 1950 and 1990 still reflect design principles established in the mid 1800's. With a rapidly changing approach to teaching and learning, and a desire to work in more transparent and interrelated ways, the deficiencies in these traditional 'cells-and-bells'¹ designs are readily apparent.

The constrained designs of traditional school models were largely based on the assumption that learning occurs most effectively within the confines of the classroom, under the constant and direct control of the teacher. When considered within the narrow parameters of this approach to education, the design of many traditional classrooms appears adequate, however, divergence into other ways of learning quickly highlights their serious limitations. Alternative learning strategies inhibited, at least to some degree, by the traditional 'cell' model include:

- Independent study
- Group collaboration
- Peer mentoring and tutoring
- Lecture formats
- One-to-one learning with an adult

¹ Cells and bells refers to an design model characterised by a linear classroom array, managed by routines, timetables and a bell.

- Technology and project-centred learning
- Distance learning
- Inquiry based learning.

In considering design alternatives, a number of models have been explored both internationally and in New Zealand. These primarily can be placed into two broad categories; Learning Studios & Suites, and Learning Streets & Atriums.

Learning Studios/Suites have been described as “flexible open plan areas with breakout space... incorporating both... shared and outdoor learning areas that can be arranged into various learning zones” (American Radio Works 2011). Often such classrooms are designed using broken or irregular spaces and are L-shaped or semi divided. Furniture is generally used for specific purposes and helps to shape the physical learning environment.

Learning Streets and Learning Atriums can be thought of as as broad expanses of linked, common space, sometimes developed as double or triple-width corridors but more commonly simply new structures build onto the face of existing classroom ‘cells’. Again, these spaces are characterised by open or closed space, heated and ventilated for comfort, with both bright and secluded areas to suit individual preferences. They are often creatively furnished to provide a variety of learning settings within a flexible structure. Such designs are relatively common in new New Zealand schools and are most evident in pod-based (awhina) designs.

Research into the use of irregular shaped classrooms, designed to facilitate learning in a variety of different modalities was being explored as early as the 1940s (Lippman). This early, work was extended by the Open Classroom (Open Plan) movement of the 1970s. Both movements suffered from a lack of pedagogical vision however, resulting in frustration for teachers as they struggled to apply traditional learning models in their newly expanded teaching spaces (Lippman).

Structured research in relation to the concept of the L-shaped classroom was also undertaken in the 1990s by James Dyck ². Dyck was one of the first researchers to actively explore the effect of classroom shape, configuration and layout on student learning. Dyck proposed the layout of the ‘Fat L as a design pattern that offers teachers options in how they might organise their classrooms to facilitate the development of their students in various learning activities’ (Nair and Fielding 2005).

For over a decade, architects and education planners, both at local and systems levels, have acknowledged that a gap exists between the design of many school facilities in the Western World and current learning theory. Nair and Fielding, two of the acknowledged leaders in innovative school design, believe that this is at least in part, due to the heavy reliance within school systems on education specifications, formulaic design requirements and reliance on exemplars and prototypes. These limitations have the clear potential to stifle of creativity and initiative (Nair and Fielding 2005).

² <http://www.designshare.com/index.php/articles/the-l-shaped-classroom/>

In seeking to increase design responsiveness, Nair and Fielding advocate the use of design patterns and design language as starting points. They point out however that such 'patterns' still need to be responsive to:

- National standards
- Funding constraints and system expectations
- The need to constantly reflect on the impact of design on learning

The impact of physical structure on social dynamics and community development (Nair and Fielding 2005).

In responding to such limitations, it is important that school design recognises learning as complex and multi-dimensional. Consequently, researchers and architects generally suggest that designs that assign space too rigidly (to specific, pre-determined activities) may not in fact meet the needs of that activity, resulting in poorly utilised, static spaces, that may inhibit, rather than promote, learning (Nair and Fielding 2005). During the course of this investigation, a number of such examples were noted with school leaders openly acknowledging that a narrow design brief had resulted in poor space utilisation.

For many New Zealand schools however, the dilemma of which model to consider for their next property upgrade is purely theoretical. In times of economic constraint, it seems unlikely that many schools will have the resources required to undertake radical remodelling of their existing buildings. Having noted that, the New Zealand government has adopted an ambitious policy position on school property redevelopment. This policy anticipates that over time, all schools will have the opportunity to modernise their classrooms and associated accommodation. It is hoped that this ongoing property enhancement will not only provide buildings that are comfortable and attractive, but also offer a resource that can be used in evolving ways, catering for the changing learning needs of New Zealand children.

The New Zealand Ministry of Education recognises the value of this objective and has adopted a property-funding model that aims to ensure all schools have the opportunity to adopt modern learning environment design principles over coming decades. The Ministry describes 'modern learning environments' (MLE) in schools as being environments that enable teachers to:

- Work cooperatively, across disciplines
- Work anywhere within a learning space or across a range of spaces
- Show learning (and teaching practice) is transparent
- Be accessible to their students when not teaching within in a designated learning space.

In addition Modern Learning Environments are expected to enable students to:

- Learn in a variety of ways: independently, in small groups, in large groups, and with peers
- Work beyond the confines of the traditional classroom
- Learn anywhere and at anytime
- Work in an ICT rich environment. (Sheerin 2010)

Despite its policy support for modern learning environments, the Ministry of Education acknowledges that research linking MLEs with student achievement is thin at best. There is very little research that

shows a direct link between quality physical learning environments and high quality learning outcomes. What research there is tends to focus primarily on the more obvious impacts of acoustics, ambient temperature, air quality and lighting. Having said that, anecdotal evidence gathered by both the Ministry of Education (Sheerin 2010) and during the course of this investigation suggests that the learning environment *does* matter and does have a positive impact on student learning.

METHODOLOGY

Given the practical nature of this investigation, a pragmatic approach to investigating the topic was adopted.

The compilation of a brief background statement and literature review was appropriate and generally accepted academic practices have been utilised in preparing these aspects of the report.

In addition, no investigation into the decision making processes of schools can be compiled without actually visiting schools, viewing their buildings and interviewing key players in the process. Consequently, the summary of the author's investigation into school decision making processes is based on interviews and observations made in ten New Zealand schools and three schools in Singapore. Interviews were conducted with principals, school leaders and teachers.

While reflecting on the most appropriate way to present the qualitative data gathered, consideration was given to reporting on each school individually. The size of the resulting report however would have been unwieldy and there were also issues of confidentiality to consider. Teachers and school leaders spoke freely and frankly, and it would be unreasonable to report their comments directly in such a public forum. Consequently, a more generalised approach has been adopted, reporting observations and actions in a more aggregated but hopefully no less useful way.

FINDINGS

The following outlines the major findings of this investigation. A generalised, bullet point approach has been used in deference to principals and school leaders who indicated that while they were happy to share their experiences (both the good and the not-so-good) they did not always want their reflections to be attributed specifically to their institution. Two main approaches to building development were identified and are described below.

(1) A Strategic and Structured Approach, Linking Pedagogy and Property

The majority of schools visited, including all of those built on new sites, indicated that from their earliest stage of planning, pedagogy and the ways in which school buildings would compliment and enhance learning, were paramount considerations in the school's strategic decision-making process. In such cases schools acted on the belief that:

- Quality design and effective use of new building resources develops from research, reflection, discussion and a shared vision for learning
- Property form should reflect beliefs about teaching and learning but not limit the school's capacity to change in the future.

An explicit, shared and strongly held vision was a central feature of these schools. The schools 'Vision' was repeatedly stated (particularly by principals) as being:

- a focal point for the school and its work
- central to strategic decision making
- a reference point when resolving contentious issues.

Schools utilising a strategic approach to their use of property also tended to believe:

- physical space should be designed to be flexible in its use
- mobility is key in all things – mobile furniture, mobile technologies, fluidity of students, a lack of static teacher stations
- that school leadership needed to be proactive in shaping teaching-teams (syndicates) to ensure a balance of skills and experience while minimising balkinisation and the development of sub-cultures.

General Observations

- newly developed learning environments are used with a high degree of consistency
- shared space is generally recognised by staff as a 'learning resource' and consequently ascribed a high value within the teaching team
- learning environments tend to be orderly, purposeful and lacking in informal aggregations of materials such as lunch boxes, shoes and school bags.
- practices relating to use of space are negotiated school-wide and are perceived by teachers as being a positive feature of the school
- structures are generally well understood by staff and (to a lesser degree) by students
- in one school, all major decisions relating to building design were made by the principal, utilising the school's vision statement and adopted pedagogy as an ongoing point of reference.

(2) An Evolutionary Approach

Two schools, both having experienced property redevelopment on their existing sites, indicated that although they were aware of the opportunities property redevelopment presented, they deliberately remained open to the possibilities presented by adopting an evolutionary approach as they worked to establish school-wide norms-of-use.

In these cases principals and teachers stated that:

- Excessive forward planning was perceived as having the potential to stifle the potential benefits of individual teacher creativity and exploration
- As norms of school practice emerged over-time, discussion, debate and research largely resolved issues as they emerged, shaping and codifying practice using an evolutionary process
- The individuality of teachers was considered central to the culture of effective learning, and that even when general school guidelines exist, space utilisation decisions will always be reflected in different ways by different teachers
- Use of space will naturally reflect the social and professional dynamic of teacher-teams
- Design decisions made early in the process may, at times, inhibit effective use of new space.

General Observations

- environments and their use tended to be variable throughout the two school
- practices relating to the use of space reflected individual or small-team agreements rather than cross-school understandings
- staff valued the ability to make individual choices though a number also commented that a greater level of agreement around the use of shared space may reduce low-level tensions that emerge from time-to-time.

(3) An International Perspective

To gain a perspective of where New Zealand school practices sit in the broader international setting, three Singaporean schools were visited during this investigation. The results are in many ways not surprising and suggest that education has closely shared, cross-border parallels, regardless of the setting.

The decision to visit schools in Singapore was based made after consideration of several international options. Singapore was considered an ideal candidate for investigation because of its:

- status as a high performing school system
- centralised education system
- government funded programme for rebuilding and improving public schools.

Background and Policy:

Many of Singapore's existing public schools were built between 1970 and 1990. These schools utilised traditional design approaches and the Singapore Ministry of Education recognised that by the late 1990s, many were reflecting their age and design limitations. Many schools continued to host at least two sessions a day and almost all were designed for a teacher-centred model of learning.

To ensure that all students have ongoing access to facilities that support a wide range of educational programmes, the Singaporean Ministry of Education initiated a major rebuilding project in 1999. The Programme for Rebuilding and IMproving Existing schools (PRIME). was planned as a staged development and aims to systematically redevelop Singapore's entire school network to reflect international design trends and standards (Ministry of Education (Singapore) 2011). By 2015 it is expected that all schools will be rebuilt or modernised with single session timetabling as the norm.

PRIME details an ambitious programme of development that will see all Singaporean schools upgraded to include computer suites, media-based libraries, specialist IT-based resource spaces, purpose-built pastoral care rooms and integrated health and fitness rooms. Teachers and students are also expected to benefit from larger, more spacious classrooms, and more interaction areas reflecting a changing approach to teaching and learning.

PRIME stipulates that schools built before 1997, with recognised space deficiencies, will be either upgraded or totally rebuilt. Upgrading work will largely involve the extension or redevelopment of existing schools on their existing site however, rebuilding is likely to be adopted when existing schools are unsuited to redevelopment, or the existing site is too constrained to enable appropriate work to be undertaken.

The order and priority for development of schools under PRIME is determined using a clear set of criteria that take into consideration; the age of the schools, the condition of existing facilities, and the availability and suitability of school sites. Construction of schools is generally undertaken using a phased approach.

The design and development of schools is outsourced to external consultants including architect, civil & structural engineer, mechanical and electrical engineer and quantity surveyor with each project being managed by an external project manager. Generally the planning process is begins with a three

month preliminary concept stage, followed by a more detailed design stage of 6 months. There is close collaboration between the various stakeholders; the principal, staff, school management committee and Ministry of Education personnel.

Where feasible, the existing school remains on-site while construction work associated with upgrading or rebuilding is carried out. If this is not a feasible option, the school is moved to a temporary 'holding site' while upgrading or rebuilding is completed. This approach is intended to minimise disruption for students and maximise the use of state-owned education resources.

Changes to teaching and learning strategies are left to the individual schools and their staff. The Ministry of Education promotes seminars and workshops on pedagogy but these are not generally linked specifically to school infrastructure. It was clear from interviews with principals and senior teachers however that pedagogy and effective use of buildings to enhance learning is a central consideration when building redevelopment work is initiated.

IMPLICATIONS

Not surprisingly, schools recognise the value of new or redeveloped property. Buildings are seen not just as locations for teaching and learning, but also as valuable learning resources in their own right, as they help to foster student engagement by providing opportunities for children to work in comfort as they utilised the flexible spaces and resources at their disposal.

In setting out on this journey, I expected to find that schools with systematic and relatively rigid approaches to the development of a shared vision for the use of new buildings would generally make better use of their resources; and although this appears to be correct to a degree, there was certainly evidence within this inquiry that a more informal and evolutionary approach also delivers useful school outcomes, via an alternative, evolutionary pathway.

CONCLUSIONS

Schools use multiple and diverse strategies as they embark on major building redevelopment projects. Pedagogical considerations are invariably central to this process.

The most common approach adopted by schools within this study was based around discussion and consultation before, during and after the building project. This approach was adopted as a way of ensuring that all stake-holders felt engaged in the decision making process, had ample time for reflection and had a strong sense of shared ownership once the project was complete. Discussion and reflection was centred as closely on pedagogy as it was on building design.

In two cases, significantly different approaches were adopted. One school indicated that key decisions relating to building design and pedagogy were made solely by the principal within the framework of a

strongly held school vision. Another school sat at the other end of the consultative continuum, deliberately adopting an evolutionary approach to decision-making, allowing teachers to explore alternative pedagogies with few if any constraints. Interestingly, teachers from both schools indicated satisfaction with both the decision-making process adopted and the outcomes achieved.

Regardless of the process utilised, it was clear from this study that:

- teachers and school leaders were motivated and energized by newly developed teaching spaces
- teachers and school leaders see building resources as central to the teaching and learning process, and recognise that they play a key role in the ongoing achievement of students.
- Teachers, school leaders and Trustees value the level of flexibility offered by current property funding and management options in New Zealand schools. While schools generally commented that additional funding would be an ideal, none considered a return to a more centralised model as having any merit.

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