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Vertical Schools as Community Hubs



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Abstract Vertical schools are an emerging form of school design in Australia. Hundreds of vertical schools, usually between four and seventeen stories, will be required in coming decades to respond to increasing student numbers in Australian cities. Locations will be in inner urban areas, where population densities are high and land availability is limited. School facilities for traditional academic programs, plus infrastructure for drama, music, exercise, sport, socialising, craft, play, and food preparation/dining, may all be useful to both students and groups from beyond the immediate school population, aiding the development of school-community connections. This chapter examines Australian vertical schools relative to more established European precedents. It traces community connections that can be discovered from visual analysis of plans and occupied buildings to investigate which spaces have potential for community use. How and why communities use different types of school spaces is explored. Consideration is given to the private, privileged, and public spaces of vertical schools. Questions are asked about whether schools operate as open or closed facilities and about how schools with more porous boundaries address children's safety. The comparison of three Australian vertical schools with seven European examples provides helpful lessons to better understand opportunities for further improvement and innovation.

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Introduction

Vertical schools are now being constructed in most Australian capital cities. Between 400 and 750 new schools are required in Australia to help accommodate an estimated one-million additional school students over the next two decades (Blandy, 2018; Goss, 2016). A vertical school, usually between four and seventeen stories, is designed to cater to the full range of teaching, administration and recreational activities normally associated with a school within one or two buildings. Though commonplace in Europe and Asia, vertical schools are a recent phenomenon in Australia. This school building typology represents a departure from traditional designs that have commonly been built along the horizontal plane. The vertical schools are fundamentally different from ‘silo’ designs, where multiple low-rise buildings are often situated on large sites with plentiful open green space between and commonly linked by covered walkways (Matthews, 2018; Swinburn, 2017).

This new form of public infrastructure is needed in Australia to support rapidly growing urban communities that have emerged since the 1990s as the result of urban consolidation policies (Matthews, 2018; Newton, 2019; Swinburn, 2017). Increasing school-age populations in these urban development zones, high land prices, and a scarcity of suitable sites make vertical schools a necessary alternative to the long-standing cultural preference in Australia for low-rise schools. In 2020, there were 9,542 public and private schools across Australia accommodating nearly 300,000 full-time equivalent teaching staff and just over four million students (ABS, 2020). Meeting the demand for school places in Australian cities through to the end of the 2020s requires the construction of seven new 25-student classrooms every day, on average (Newton, 2019). This demand requires around one billion dollars of additional government expenditure per annum (Goss, 2016).

A recent survey of parents and educators across Australia revealed that school facilities for school-aged students are also widely valued as ‘hubs of community’, providing settings that deliver broad social benefits (Renton & Stobbe, 2020). This chapter focuses on the idea of vertical schools as community hubs and traces community connections that can be discovered from visual analysis of plans and occupied buildings. We analysed building layouts and spaces used by community; the interfaces at the school edges; access and security; sight lines; signage and other traces of occupation; and the discourses by users, school leaders and designers in relation to vertical schools. Recent examples of vertical schools in Australia are compared with northern European examples, where vertical schools have a longer history. Consideration is given to various forms of space and their uses, permeability, safety issues and other factors that influence community use of vertical schools. Inspired by European design, the chapter concludes by identifying opportunities to improve vertical

schools in Australia, especially in ways that can enhance school-community connections and the urban realm. These include blurring boundaries and reducing fences to encourage spatial and social integration, increasing risk tolerance and co-locating more community services like kindergartens within vertical schools.

Background and Context

Urban consolidation is a preferred planning agenda in large Australian cities, designed to densify and enliven urban areas while reducing suburban sprawl (Raynor et al., 2018). Many families are now choosing to remain in urban core areas, slowly reversing a long-standing preference among Australian households with young children for suburban settings. This has fuelled an increase in inner-urban residents, including school-aged children. As one example, enrolments for inner city schools in Sydney have risen by more than 13%—nearly 3.5 times the state average—since 2012 (Swinburn, 2017). Consequently, there is escalating demand for inner-urban school spaces which, along with limited land availability, is leading to the emergence of vertical schools (Truong et al., 2018).

All Australian states except Tasmania are currently developing vertical schools (Newton, 2019). State governments are spending billions on new school infrastructure as part of long-term investment cycles (Goss, 2016). A small number of vertical schools are already built, with many more due to be delivered to address rising enrolment demands in inner city neighbourhoods. The Chief Executive for School Infrastructure NSW stated, “Vertical schools are absolutely a part of the landscape, particularly with increased urbanisation and land availability the way it is” (O’Sullivan & Gorrey, 2021). The Victorian Minister for Education stated in a media release, “We are rolling out eight vertical government schools to make sure there are enough school places for young Victorians across the inner city” (Premier of Victoria, 2021).

Australian vertical schools can be divided typologically into mid-rise and high-rise. Most are mid-rise, between four and seven storeys. Taller schools of up to seventeen storeys are being developed in New South Wales, Victoria, and Western Australia (Newton, 2019). Vertical schools and their campuses will become learning hubs for expanding student cohorts, as well as providing social infrastructure for inner-urban communities into the future. These new pieces of urban infrastructure are connected in complex ways to their surrounding built, natural and material environments (Botsoglou et al., 2019; McLeod, 2014a).

School campuses and buildings are traditionally seen as central features of neighbourhoods. They are embedded in locality and community and have potential to become iconic placeholders of civic values and traditions over time (McLeod, 2014b). This means that schools are not just learning spaces; they are important forms of social infrastructure that are connected in complex ways to their adjacent built, natural and material environments (Botsoglou et al., 2019; McLeod, 2014b). The architecture and spatial arrangements of schools intersect with education ideas and

practices, as well as the community and the citizen (McLeod, 2014b). Innovations in school design therefore reflect changing forms of social engagement with communities, as well as shifting approaches to education and learning (McLeod, 2014a, 2014b). Within this context, educators, architects and planners are key protagonists in creating positive connections between space and pedagogy (Goad, 2014). There is a need for ongoing stakeholder dialogue to create schools that function well as learning environments and as social infrastructure (Halarewicz, 2017). Educators, design professionals, urban planners, policymakers, and parents should ideally collaborate to co-design vertical schools to maximise educational and community benefits (Halarewicz, 2017).

Past innovations in Australian school design included two major periods of reform. The first was in the 1930s, under the banner of “the project of modernity” (Dale, 1992, p. 203). Best practice established at the time and carried forward took the view that “the 2015 ideals, both pedagogical and aesthetic, of a generation of educators and architects were held in common” (Goad, 2014, p. 191). This was the beginning of the recognition that cooperation between educators, architects and planners is necessary to ensure positive connections between space and pedagogy (Healy & Darian-Smith, 2015; Kinchin & O’Connor, 2012). A second period of reform occurred in the 1970s. This advanced the ideals developed in the 1930s, but added a call for “collective biography, of progressivism in education” (Goad, 2014, p. 191). This meant that efforts to create openness between educators and designers can provide educational spaces, while also creating places that enrich broader communities (Goad, 2014; Healy & Darian-Smith, 2015).

The reforms of the 1970s also increased interest and exploration of the ‘community’—something that is both within and around schools. Community in this sense involves parents and the general population, since both groups also interact with school buildings and campuses (Goad, 2014; Healy & Darian-Smith, 2015). However, practical engagement with local communities was not well articulated during this period. Applying these lessons to vertical schools, as a third significant period of reform in Australian school planning and design, highlights the importance of collaborative dialogue between stakeholders to ensure learning spaces and social infrastructure can be enjoyed by diffuse groups.

Analysis

Various themes emerged as we contrasted recent Australian vertical school designs with European examples. We found similarities in the types of facilities shared between schools and communities. In analysing plans and spaces, we considered the affordances brought by facilities located near entry points and the links between design intentions and usage. We found distinctive issues related to the design of entry experiences, as well as boundary conditions. We noted different arrangements for outdoor spaces and different attitudes to community and risk. These themes are often interconnected. For example, attitudes to risk aversion

impact the entry arrangement and whether there are supervised gateways between spaces for the community and spaces for students.

Facilities Shared Between Communities and Schools

Australian vertical schools (Table 1), like their European counterparts, benefit by proximity to community facilities. St Andrew's Cathedral School in Sydney, built in 1976, is Australia's oldest vertical school. Students occupy the top three levels of the eight-storey brutalist office building in central Sydney. They use the adjacent cathedral as an auditorium, the city library and museum for learning, and the playing fields at the University of Sydney (Curnow & Lambert, 2015). The university makes use of St Andrew's classrooms after hours in a reciprocal arrangement.

Haileybury City Campus is Melbourne's first private (independent fee-paying) vertical school. Rather than being built from scratch, Haileybury is in a retrofitted, 30-year-old office building. Its development in 2017 was undertaken in response to the rapidly expanding city residential population revealed by the 2011 census. Haileybury, like St Andrew's, benefits from its central city location for cultural, educational, sporting and recreational facilities.

Botanic High School (Fig. 1) is Adelaide's first vertical school, with two adjacent buildings on site. It incorporates six learning levels in a repurposed university building and seven levels within a new building. Botanic High also makes use of adjacent city facilities for teaching and learning, particularly the nearby botanic gardens, parklands, University of Adelaide, and extensive arts precinct. Of the Australian vertical schools, Botanic High is most like the European precedents in terms of how outdoor spaces are freely available for use by the broader community outside school hours. The school-to-community boundaries are porous and only semi-defined by height-level changes, with robust outdoor tables and chairs accessible at all hours.

The four-level Fisherman's Bend Secondary School (VSBA, 2021) is part of Australia's largest urban renewal precinct. It has four distinct quadrants at ground level linked to community—gymnasium, performing arts, learning resource centre and food technology. All are designed to be shared with community after hours. Similarly, North Melbourne Hill Primary School will share its large, universally accessible playground with the community after hours and welcome community groups to use its gymnasium, library and performing arts spaces (ArchitectureAU, 2021).

Fortitude Valley State Secondary College, on the fringe of Brisbane's CBD and in a rapidly changing inner-city suburb, is the first school built in the centre of the Queensland Capital in 50 years. The eight-level building, on the ground of the former Fortitude Valley State School, is walking distance from one of Brisbane's main railway stations. It is near expanding local communities in Fortitude Valley, Bowen Hills and Spring Hill. Heritage listed buildings from the former state school have been incorporated into the site's masterplan to retain identifiable connections to the historic school that first occupied the site. The design aims to become a new prototype in terms of learning spaces. It combines traditional classrooms with informal

Table 1 Vertical Schools in Australia

| School name | State | Location | Years | Date | Peak Enrol | Floor Levels |
|-------------------------------------------|-------|------------------|-------|------|------------|--------------|
| St Andrew's Cathedral Sc ¹ | NSW | Sydney CBD | K-12 | 1976 | 1100 | Top 3 of 8 |
| Arthur Philip HS ² | NSW | Parramatta | 7–12 | 2020 | 2000 | 17 |
| Parramatta Public ² | NSW | Parramatta | F-6 | 2020 | 1000 | 4 |
| Inner Sydney HS ³ | NSW | Surry Hills | 7–12 | 2020 | 1200 | 11 |
| Santa Sofia Catholic College ⁴ | NSW | Box Hill | K-12 | 2021 | 1860 | 6 |
| Fortitude Valley State SC ⁵ | QLD | Fortitude Valley | 7–12 | 2020 | 1500 | 7 |
| Brisbane South SC ⁴ | QLD | South Brisbane | 7–12 | 2021 | 1650 | 7 |
| Adelaide Botanic HS ⁶ | SA | Adelaide CBD | 7–12 | 2019 | 1250 | 7 |
| Haileybury City Campus ⁷ | VIC | Melbourne CBD | EL-12 | 2017 | 800 | 10 |
| South Melbourne PS ⁸ | VIC | South Melbourne | F-6 | 2018 | 525 | 6 |
| Richmond HS ⁸ | VIC | Richmond | 7–12 | 2019 | 650 | 4 |
| Prahran HS ⁹ | VIC | Prahran | 7–12 | 2019 | 650 | 5 |
| Fisherman's Bend SS ¹⁰ | VIC | Port Melbourne | 7–12 | 2022 | 1100 | 4 |
| North Melbourne Hill PS ¹¹ | VIC | North Melbourne | K-6 | 2023 | 525 | 6 |
| Fitzroy Gasworks ¹² | VIC | Fitzroy | 11–12 | 2022 | 650 | 6 |
| McKinnon Secondary C ¹³ | VIC | McKinnon | 7–12 | 2022 | 1100 | 4 |
| St Georges Anglican GS ¹⁴ | WA | Perth CBD | 7–12 | 2015 | 290 | 6 |

¹ Noel Bell and Herbert F Hely² Grimshaw Architects with BVN³ FJMT Architects⁴ BVN Architects⁵ Cox Architecture with Thomson Adsett⁶ Cox Architecture with Design Inc⁷ Darren Carnell Architects⁸ Hayball Architects⁹ Gy Puksand¹⁰ Billard Leece Partnership¹¹ ARM Architects¹² GHD Woodhead and Grimshaw¹³ K2LD¹⁴ DWA Architects



Fig. 1 Outdoor spaces, Adelaide Botanic High School (Image from Cox Architecture)

spaces and make the most of the subtropical climate of Brisbane, integrating plazas and balconies that perform as an array of diverse open spaces to support flexible learning and other activities.

Richmond High School, in the inner urban ring of Melbourne, has outdoor spaces that, while fenced, are kept open after hours and on weekends for use by the community. Outdoor spaces with playground equipment are particularly valuable in inner city areas as more families occupy apartments with limited outdoor areas.

Community and School Co-use of Indoor Spaces

The broader community of Richmond also benefits from after-hours access to Richmond High School. Interstitial spaces are used by multiple groups near the entry areas, including spaces for drama and music. This deliberately breaks up any hard lines separating school-use and community-use. The school is located near community sports facilities, including a pool and netball courts. The school gymnasium offers extending the opening hours to ensure use by both the school and the local community groups, supporting more efficient infrastructure use.

The six-level South Melbourne Primary School, also located in an inner-urban area, was conceptualised in the context of the new and dense Docklands urban community. The design brief envisaged school spaces to support residents living in nearby apartments. A priority was to accommodate after-hours use of facilities, such as makerspaces and meeting rooms, as well as access to music, drama and sports areas. Prahran High School, another vertical school in Melbourne, has a rooftop gymnasium, garden and running track that are likewise offered for after-hours use by community.

The Symbolic and Functional Importance of Central Atria

The Victorian and South Australian vertical schools are designed around central atria. These are intended to form a visual heart and gathering space for each school, while connecting the vertical levels and making learning spaces more visible. This is in contrast with traditional classrooms off corridors. Rather than just connecting levels with staircases, seating is provided as an integrated component of stair design. These have become known as Hellerup stairs after their early integration at Hellerup School in Copenhagen by Arkitema Architects (Fig. 2).

For example, South Melbourne Primary School uses a central stair as a theatre space. At Prahran High School, students use the central stair for presentations, informal gatherings and general study (Fig. 3). Richmond High School has a smaller Hellerup-model stairway located just inside the entry. Students enter the school through the atrium each day and are welcomed by the principal. With seating on the stairs to the side and a canteen nearby, this entry sequence is like many of the northern European examples where the boundaries between public and private are blurred.

Fig. 2 Hellerup School, Copenhagen (Image by author)





Fig. 3 Prahran High School (Architecture by Gray Puksand. Image by Peter Clarke Photography)

Blurred Boundaries Versus Gated Communities

The three Copenhagen schools we studied—Ørestad Gymnasium, Hellerup School and Sydhavnen School—each have entry sequences from surrounding neighbourhoods, rather than controlled access gateways with reception desks in public foyers. Visitors enter Hellerup School through a recreation room to reach the central stairway. By contrast, Ørestad Gymnasium, by 3XN Architects, has a traditional formal entry mid-way along its rectilinear and colourful façade. Entering the school, visitors walk into an atrium where boomerang shaped floor platforms hold circular learning pods, often cantilevered into the atrium.

At the Sydhavnen School administration staff can view the entry from an upper level rather than in a control desk area near the entry. Visitors arrive into a double



Fig. 4 Outdoor spaces, Sydhavnen Skolen, Copenhagen (Image by author)

height space with student artwork and a mix of informal furniture. There is a view through the dining area to the outdoor spaces. The local authority takes responsibility for maintenance of the school's outdoor spaces, including the school roof, which is constructed as an outdoor landscape of timber steps, accessible to the community (Fig. 4).

On entering each of these Danish vertical schools, visitors move from a *public* space to a *privileged* or *invited* space before reaching the more *private* learning spaces within the school. Conversely, visitors entering vertical schools in Australia are generally overtly controlled with reception areas acting as gateways between a public foyer and the school beyond. Richmond High School is an exception to this trend. New vertical schools developed for the Victorian School Building Authority often have separate waiting areas for the public and students. Public access to the northern European schools often appears to be less clearly defined by the architecture. For example, The Swedish school of Herrestaskolan by Liljewall Architects uses signage instead of a reception desk to orient visitors (Fig. 5).

Perceived and Real Risks

A topic of significant practical concern is how community attitudes towards risk influence the indoor and outdoor design of vertical schools. Considerations of student safety are approached in a direct way at the Sydhavnen School. There, the playground is adjacent to a canal, but the school community chose to keep the canal unfenced with the rationale that children needed to learn to be safe near bodies of water. The



Fig. 5 Entry sequence with signage, Herrestaskolan, Sweden (Image by author)

roofscape can be played upon as a large stair with few handrails (Fig. 4). Australia is generally more risk averse, so a similar play area or unfenced water access might be perceived as unsafe. The Fortitude Valley State Secondary College has a fully fenced ground; the green and recreational area is designed between the new building and the railway station, to shelter the students from any external interference.

Urban Presence

Unlike St Andrew's, Botanic High and Haileybury College in Australia, the European schools we studied tend to be further from the city centres in areas, though are still in areas with extensive apartment living. Direct sightlines from public paths into internal learning spaces are not unusual in the European schools. The Finnish Saunalahti School general learning spaces and the Herrestaskolan gymnasium both have windows that look on to adjacent public paths. Figure 6 shows views from Sydhavnen School to the public street. Vertical schools in Europe are often built to the external boundary adjacent to roads and footpaths. Such practice is uncommon in Australia, where efforts to avoid members of the public viewing areas occupied by children is often a design intent. A common approach is to ensure learning spaces are distanced from public areas or separating with the use of a corridor. Botanic High is an exception with adjacent outdoor areas at ground level directly accessible by the public. Rather than using fences to define a school zone apart from adjacent parks and gardens, Botanic High is directly positioned within the public gardens. This brings of the multiple benefits of students accessing generous public gardens;



Fig. 6 School boundaries, Sydhavnen Skolen, Copenhagen (Image by author)

the community accessing the outdoor decks and tables provided by the school; and bringing the public closer to the school for invited activities and events.

Co-located Community Functions

We have not yet visited many Australian or northern European examples of co-located community facilities such as community centres and kindergartens in vertical schools. However, co-located community facilities do exist in some Australian vertical schools. Both South Melbourne PS and North Melbourne Hill PS have kindergartens on the top level. This allows the schools to function primarily as education facilities, while simultaneously adding more child-care options for local communities. Co-locating kindergartens with primary schools can reduce traffic, increase community footfall and allow children to enjoy longer associations with their local school. Arthur Philip High School in NSW has provided flexibility for future community uses but these have yet to be fully activated.

Fiep Westerdorp (Fig. 7) in Amsterdam is a European exception, as it co-locates a school, nursing home and apartment complex around a shared playground. While visiting this school we spoke with a waiting parent who explained the convenience of living in an adjacent apartment as he used a wheelchair. Mixing generations is sometimes regarded as having mutual benefits (Warner et al., 2010). Anecdotally, teachers we spoke to at Fiep Westerdorp and residents in the adjacent nursing home did not



Fig. 7 Mixed uses of Fiep Westerdorp, Copenhagen (Image by author)

see the relationship between the school and the nursing home as being synergistic. Further research is needed to better understand why users perceive this disconnect.

Calvijn College (Fig. 8) in Amsterdam, by Wiersema Architects, has a program entitled NEXT, where students connect with local communities in a range of ways including preparing and serving meals for older local residents as part of an internship. School kitchens are used for events. A sports program and training in hairdressing and beauty are interconnected to community, with a range of partner organisations contributing in turn to the student education.

Conclusion

Vertical schools are becoming more prevalent in Australian cities and will continue to be built in numbers, at least in the medium term. Urban consolidation policies, leading to larger inner urban communities, combined with demographic changes and rapidly rising student numbers, ensure this trajectory. Vertical school development may be the third period of reform in Australian school planning and design. It is both justified and reasonable to state that vertical schools represent the most pressing infrastructural imperative in Australia cities in the coming years.

This chapter traced community connections from visual analysis of plans and occupied vertical school buildings and campuses in Australia and Europe. It offered insights into commonalities and divergences across a variety of domains, including space design and use, urban presence, permeability, safety and the potential for co-locating other activities and services within or adjacent to vertical school campuses.



Fig. 8 Shared spaces for young and old at Calvin College (Image by author)

The early Australian vertical schools are performing well overall. Their planning and design processes were generally well informed by collaborative dialogue between stakeholders and with local communities. Still, there are important lessons from northern Europe, where vertical schools have a longer history. European lessons relevant to Australia include the intentional blurring of boundaries and exclusion of fences to encourage spatial and social integration. Risk tolerance and attitudes towards risk as a teaching tool is more common in European examples, which increases student alertness while reducing hard boundaries. Co-locating community services like kindergartens within vertical schools has a longer history in European examples.

Lessons on good practice from overseas are a helpful first step but deeper, mixed-method research is needed to fully explore the complexities of how vertical schools can best operate as community hubs in the Australian context. Vertical schools and their campuses can be innovative and functional learning and community spaces if designed correctly. Hopefully Australian governments will support this view and work to create desirable, immersive and practical spaces. To support this, the next phase of research requires location and context-specific investigations of vertical school development in Australia. Inter-disciplinary research, involving educational space designers, teachers, urban planners, architects and education scholars, will help maximise community and learning outcomes from vertical schools as they become common and central forms of social infrastructure in twenty-first century Australian cities.

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