CHANGING THE ARCHITECTURE OF EDUCATING

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ABSTRACT

School design occurs within a complicated matrix of divergent aspirations of the stakeholder community, changing ideas on education pedagogy and uncertainty on the most effective environments to facilitate learning. There are many contributors in the school design processes, each with their own objectives, creating a challenging climate for the architects to design within. Through research, exemplar case study analysis and reflection on school architecture projects that I have completed over the last ten years, I have identified three key relationships in the school design processes between the School Community, Architect and Pedagogy. The roles, interactions and participation of these three parties can impact the architectural outcomes. A series of deficiencies and reoccurring issues were identified by this study, which potentially inhibit the development of the three key relationships. To assist the architect in navigating these issues, my PhD research has focused on the development of School Design Tools, which provide strategies and approaches that can be used at different stages of design to assist in bridging the areas of deficiency. The tools identify key aspirations and objectives at each design stage, and evolved with the development of the project. They aim to capture and build on the three key relationships through facilitating and structuring the briefing process with the school and creating a balance between the School Community, Architect and Education Pedagogy, so as to support the design of more effective school architecture.

KEYWORDS: LEARNING ENVIRONMENT ANALYSIS AND EVALUATION, POST OCCUPANCY USE, SCHOOL DESIGN.

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INTRODUCTION

School design occurs within a complicated matrix of divergent factors such as the aspirations of the stakeholder communities, changing ideas on education pedagogy and uncertainty about the most effective environments to support learning. There are many contributors in the school design process, each with their own ideas and objectives, creating a challenging environment for the architect to design within. The stakeholder community encompasses a broad range of parties, from government, through to school communities of teachers, students and their families - each with a different understanding of what constitutes a school (Bonnor, 2012). For education pedagogy, there are different schools of thought, as well as constantly evolving theories on the most effective way of educating students (Encyclopaedia of the Sciences of Learning, 2012). Architecture has a role to play in designing new types of education spaces that align with current thinking around education pedagogy (SOV DEECD, 2008; SOV DEECD, 2009a).

Between 2000 and 2014 in Australia, government funding for schools increased by approximately 74 percent (POA DOPS, 2013). Between 2000 and 2012, however, Australia’s international education ranking dropped (Lokan, Greenwood & Cresswell, 2001; Thomson, De Bortoli, & Buckley, 2013), in part due to a decrease in education standards, but also due to a rapid improvement in performance in countries in South East Asia. These results have raised concerns about our education system, and influenced changes to Australian Government school policy to focus on initiatives to improve learning outcomes (MCOEETAYA, 2008; DEECD, 2012). In evaluating the effectiveness of schools, there is a recognition by the government that many factors impact on learning environments and outcomes. ‘New learning environments are always welcome for schools and their communities. However, the most awarded designs will seem to be failures if the activity and behaviours of the people who occupy them are not innovative and characteristic of 21st century education (SOV DEECD, 2009b).

As an architect, I’ve spent 10 years working on the architecture of schools with practices including HASSELL, Y2 Architecture and in my own practice. I’ve experienced the complex environment surrounding school design and observed a range of inconsistent architectural outcomes emerging from what are fairly regulated school procurement processes within the Victorian Government sector. These experiences raised questions around my past school design approaches and prompted the development of this PhD as an avenue through which to explore new approaches to designing school architecture, it’s relationship with education pedagogy and the needs of the school community. It is hoped that this research will facilitate a more conscious way of working through design issues within my practice.

COMPARATIVE ANALYSIS DIAGRAMS

Through a series of comparative analysis diagrams, I reflect on school projects undertaken at HASSELL and Y2 Architecture, prior to commencing the PhD research. The focus of these diagrams is on the relationships between the architect and key stakeholders in the school design process. The aim of the diagrams was to see if I could identify similarities across all projects that might be impacting on the architectural outcomes. These projects are compared with exemplar school projects across government, Catholic and independent school sectors. My research interest focused on the different school project outcomes that were produced under similar design and procurement processes. Through this process I was studying three things;

- Firstly, the role that each party played;
- Secondly, how they interacted with the other collaborators; and
- Thirdly, how each collaborator influenced the development of the brief which informed the architecture.
In total, 12 school projects were studied, including two projects I worked on with HASSELL: Bendigo South East College and Crusoe Secondary College. The others were projects that I had worked on with Y2 Architecture: Keysborough Springvale Regeneration Project, Mt Egerton Primary School, St Josephs Catholic College, Ballarat Regeneration Project, Croydon Regeneration Project, and Mt Ridley P-12. My projects were compared with the exemplar projects Preshil, Dandenong High School, Melbourne Grammar School and St Frances de Sales Primary School. In the diagrams I’ve mapped the relationships between collaborators such as the school principal, parents, the department of education, the project manager, architect, education consultants and the builder – each of which are represented through the different colours within the diagrams (figure 1).

**SCHOOL DESIGN RELATIONSHIPS**

The reflection diagrams mapped collaborators in the school design process, revealing the complexities and variations across projects. Once mapped and analysed for similarities across the projects, I identified that the collaborators represented three key relationships between the architect, school community and education pedagogy (fig 02). The school design process seemed to hinge on the balance between these three parties and each party’s ability to perform its role. However, there were clearly challenges and issues impacting on the interaction of these three relationships, as represented in the Three Key Relationship Diagram (figure 3).

The diagram represents how the school design process can work effectively in an ‘ideal’ project. The school community, architect and education pedagogy are viewed as three different poles, which push and pull against each other in the school design process. In the context of this diagram, the School community pole includes students and their families, teachers, school leadership, councils, and
government bodies as the main stakeholders contributing to the school design. The Education pedagogy pole describes the method and teaching practices used by a school for the education of its students. The Architect pole includes the role of the architect as designer and the architecture of the learning environment. In the diagram, the role of each pole in the school design process is outlined and, in an ideal design process, there is a balance between the three poles, with each pole actively contributing to the design.

Through recognising that school design is not just about designing architecture, but the building of these three key relationships in the school design process, I realised that I needed to develop a new approach to how I design schools. This led to the development of the School Design Tools, to assist the Architect in navigating this space and working through the different objectives of the school community, architect and education pedagogy.
The Sandringham College case study was a turning point in my PhD, as it enabled the development of my idea for the School design tools through practice work with an existing school community. Sandringham College is a government school and had missed out on government funding, including BER, for a number of years. The school was operating in a mix of traditional general-purpose classroom buildings from the 1940s to 1990s, in various stages of disrepair. The school was expecting funding for new school buildings and its school community was keen to start thinking about how to approach a new school design.

Sandringham College is made up of three campuses: two Middle School Year 7–10 campuses at Bluff Rd, Sandringham and Beaumaris and its Senior Year 11–12 campus in Sandringham. Students for the two middle schools are generally from the local area, but the senior campus is a large specialised school, offering strong links to tertiary institutions, and attracting students from right across Melbourne due its extensive subject range.

In the development of the School design tools, I completed a number of projects with Sandringham College, including the Facades master plan project, Site observation work, Design studio teaching, School design advice, Prototype spaces and speculative design in the Sandringham project (figure 4).

**Figure 4: School design tool projects.**
The development of the School design tools initially began through diagramming the design process on the Sandringham projects. The projects were reflected on through the three key relationships I’d identified earlier in the PhD between the school community, architect and education pedagogy. This earlier diagram formed the basis and point of comparison for my aspirations on how the relationships in the school design process could ideally work (figure 5). When I mapped the relationship interactions on the Sandringham Projects, I looked at how the relationships worked and what was inhibiting them from working in the desired way I’d initially diagrammed. I was interested in an increased understanding, firstly of the role each party played and, secondly, how they related to and influenced the other two parties in the school design process.

Through the School Design Tool Identification diagram I started to document recurring issues between the school community, architect and education pedagogy. These issues then became points of intervention, whereby the architect could do focused work through the School design tools to strengthen these areas and bridge the gaps between the three key relationships. In this way, the School design tools operate in-between the three key relationships, to assist in facilitating how they can work more effectively together.

Through this process five potential issues arose in the areas of school identity, observation, communication, design intent and prototyping – areas in which the School Design Tools could facilitate the participation process with the school. These terms are broad and I selected them to assist in engagement with the school, but also to empower them. This means the focus of each tool needed to be clear, easily understood by the school, and encourage their engagement in the discussion. The tool names are deliberate, avoiding jargon or overly technical language, to assist the staff in engaging with the issues.
SCHOOL DESIGN TOOL LOOP

The School Design Tools are used by the architect in a loop-type process and are designed to assist in identifying and articulating briefing information to inform the development of the architecture. The School Design Tool loop describes the interactions between the use of the tools and their relationship to the design process. The interaction between the tools on each loop is a central part of the process. There are three stages in the use of the School Design Tools, indicated through three loops. The process begins through working around the inner-loop, with a pre-brief development of the school identity and observation of education environments in the existing school. This is followed by communication of the key information and establishment of the design intent. The architect works with the school in a cyclical process around this loop until a clear design intent is established. This first loop can be used at each traditional procurement project stage, such as master planning and sketch design, in working through the development of design issues. The middle loop takes the design intent into a testing phase, through the development of prototype spaces. This could occur in sketch design and design development phases, allowing experimentation before the final design is committed. The tests in the prototype space can be reflected on and evolved upon. The outer loop involves the development of successful ideas in the prototype to be evolved into the final design and documentation. This outer loop occurs during the design development and documentation project phases. The tools employ techniques such as observation, listening, reflection, communication, clarity and testing to discover new information to inform the school design process. The School Design Tools also assist in communicating the key steps for the school and architect in the design process - identifying key information that needs to be established before proceeding to the next step. The School Design Tools make the thinking in the design process visible and assist in communicating where and how the school community, education pedagogy and architect need to contribute to the project.

Figure 6: School design tool loop.
The loop process of the School Design tools also assists in managing the design process and assists in facilitating school participation by making it easier for them to understand and contribute. The loop acts as a communication device in the design process, with the arrows indicating the sequence of steps. The visibility of this process allows reflection on the decisions which have been made, and ensures the message is being heard. This could also provide a new model for a return brief to the school, where the information collected from each design tool can be communicated back to the school. This could work to empower the school to be more involved in the participation process and encourage teachers to be willing rather than resistant participants. This assists school leaders in getting teachers on board. In this way, the school design tools and loop process empower the school community and assist the architect in listening to the feedback from the school. The aspiration being, that the increase in dialogue enabled through the communication tool will contribute to the design of more effective schools.

**SCHOOL IDENTITY TOOL**

To assist the architect in developing an understanding of the School Community, I created the School Identity Tool. In my past practice projects, I had found that many schools had an underdeveloped sense of their identity, which also impacted on their capacity to develop an education pedagogy which responded to the needs of the School Community. This tool provides a way to develop the School Identity of the School Community so it can inform the architecture (figure 7).
The second tool is the Observation Tool. In the development of the architectural brief, architects run many consultation sessions with teachers at schools to develop an understanding of the types of learning environments they would like. However, teachers found it difficult to sometimes describe what it is they do, and the types of environments they need. Through use of the Observation Tool, I aimed to bridge across the gaps between architects and educators and reveal what was implicit in their practice by observing how they use space (figure 8).

COMMUNICATION TOOL
The third tool is the Communication Tool which assists in communication and the bridging of knowledge domain gaps between architects and educators. Architects think and communicate in visual and spatial ways - such as through drawings, and physical or digital 3D models. But these can be challenging for teachers to read and understand. This tool aims to create ways of communicating using boundary objects, which act as a communication bridge between the education and architecture subject areas (figure 9).

**DESIGN INTENT TOOL**

The fourth tool is the Design Intent Tool. In many school projects I have worked on, there is an abundance of influences which inform the architecture. These can push and pull the project in many directions, and the design intent of the architecture can become muddied. Through the assistance of diagrams, this tool aims to bring together all the information gathered using the other tools, and ensure that they clearly are represented in the design intent in the architecture (figure 10).
The fifth tool is the Prototype Tool. This provides the opportunity to test the design intent before the design is finalised. This allows teachers and students to experience the spaces, and provide feedback to inform the design, assisting the architect in refining the design (figure 11).

DISCUSSION

The School Design Tools present a new method of working for the architect in the school design process. This method recognises that creating a school is not just about designing architecture, but also about the development of the relationships between stakeholders. The School Design Tools facilitate the building of these relationships by assisting in bridging the gaps between those involved in the process through the provision of strategies and approaches to some of the recurring design process issues identified within this PhD research.

The series of projects completed with Sandringham College allowed the exploration of these issues and the development of the School Design Tools. Through the extraction and recording of briefing information, these tools can be utilised in the school design process to assist the architect to develop a deeper understanding of the clients’ needs and the complexities of the interactions between stakeholders.

The suite of tools acknowledges the complexities of school design and the messiness of the process, suggesting different ways of working with the mess, rather than trying to organise it into a format we can understand and ignoring the parts we don’t understand.

The School Design Tools represent a shift in my understanding of the role that the architect, school community and education pedagogy play in the school design process. I recognise that the architect can play a more active role through the use of the School Design Tools to develop the three key relationships and their capacity to effectively collaborate with each other. Through this PhD research, I recognised that each party has two roles to play – an independent role and a collaborative role. In the independent role,
each party has specialist knowledge in the subject area it represents. The stakeholders understand and define the school community, the teachers and school leaders create and practice the education pedagogy and the architect has specialist knowledge in designing architecture. Whereas in the collaborative role the emphasis changes with each party needing to actively contribute to create a shared project vision.

The School Design Tools provide guidance and direction for the architect and school community through a clear loop process, identifying objectives that need to be resolved before the next step can take place. This provides greater clarity on each party’s role, as well as when and how each group can effectively contribute. The information collected through the tools is of reciprocal benefit to the school and the architect. The tools assist the school in developing a leadership role in the development of their school identity and education pedagogy. At Sandringham College, the school learnt from the information collected through the School Design Tools, providing the school with a different perspective and a new understanding of their school community. The School Design Tools benefit the architect through increasing their understanding of the school community and education pedagogy and focusing on how they can effectively inform and be revealed in the school architecture. In this process, the school learns about design and the architect learns about education.


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