

# ON THE PEDAGOGICAL BENEFITS OF INCORPORATING DIGITAL MEDIA IN THE TEACHING OF ARCHITECTURAL HISTORY AND THEORY

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**Abstract.** This paper reports on the use of physical and digital media in a *history and theories of twentieth century architecture and landscape* course. An electronic bulletin board (*ebb*) was used to generate an open forum for critical dialogue on textual, physical, and digital media. It gave teachers and students the ability to observe the course in new ways. Student interactions with the *ebb* transformed a culture of hidden collaboration to an open exchange of ideas and concepts. Of particular interest here is the use of 3-D digital composing tools (VRML) that provided a simple, but powerful way to visualize ideas which physical representation often could not. This approach instilled a philosophy of linking design and theory, where history and theory are seen as a body of knowledge consciously brought to bear on design practice.

## 1. Introduction

*Twentieth-Century Architecture and Landscapes* is a second-year course in the undergraduate architecture programme at the University of Adelaide. It focuses on “forms of thinking” in twentieth-century design disciplines to provide an understanding of generative ideas and resultant forms in a historical framework. The course introduces students to the complexity of spatial issues and compositional ideas. By studying the formal and theoretical resources of twentieth-century architecture, landscape architecture, and urban design, the content extends students’ abilities to critically examine published materials and projects. It has been delivered in the mode described here since 2001.

To facilitate creative self-learning strategies and maintain a highly motivated student body (Biggs, 1999), this course included a series of short and longer exercises which helped pace a consistent critical stance both with the material covered and its comprehension. The series of short exercises, in three-dimensional composition

and analysis, critiques and topical debates, built bridges between the theoretical component covered and its self-directed exploration. Ongoing critical dialogue was facilitated through the medium of an *electronic bulletin board* (*ebb*). It constituted the foundation of the student-centred learning strategy. Culminating in a major project, students explored the ideas and forms of twentieth-century architects or landscape architects of their own choosing incorporating a four-dimensional approach: an on-line text together with complementary on-line (3-D) spatial compositions (Scriver and Wyeld, 2003).

The *ebb* is an on-line forum, which through a series of submissions of increasing complexity and duration, or “e-Tasks”, enabled students to express their views and to critically examine those of their peers; to make links to pertinent published references and other resources, and to put out additional material to support their own arguments. The *ebb* is essentially an on-line discussion board or virtual gallery that operates within a larger on-line learning support system developed for use throughout the university. As an interactive website it enabled students to publish text, images, 3D models, animations, sound clips, and hyper-links to other pages and sites including the submissions of other students. Users could display and cross-index its progressively expanding content in a variety of modes (theme, author, date). The basic pedagogical objective of the *ebb* discussions was to stimulate an informal but accountable dialogue between students—extending and complementing the dynamics of the teaching sessions. This process helped them sharpen their critical grasp of the course content and pertinent architectural, historical, and theoretical issues.

## 2. Design Strategy

The course utilized commonly available technology in a purposeful way to offer students exciting self-directed learning opportunities via an emphasis on integrative learning. It recognized the importance of contemporary 3-D digital composing tools in communicating complex, evocative, conceptual, and philosophical ideas arising from the students’ chosen juxtapositions and in a ternary manner, their own interpretations. The major project allowed students to visualize things that simple physical representations may not. It fostered multiple ways of perceiving and doing in an abstract way. Of particular importance to this stance was the relationship between the critical texts that accompanied students’ design submissions

In the major project, students selected an influential contemporary architect or landscape architect whose work they studied in depth. They juxtaposed their understandings of the material uncovered with another, earlier architect/landscape architect whose work or school of work bore a significant formal, conceptual or otherwise critically intriguing relationship to the work of their contemporary designer. The major project had multiple objectives and encouraged students to

explore relationships between formal conventions and theoretical intentions in architectural and landscape design via the use of physical and digital modelling. Emphasis was placed on critical relationships between contemporary “tectonic/spatial languages” and theories.

As a prelude to the major design project, students developed a text and explored their initial ideas through a simplified version of the project. They were encouraged to interpret the same text they composed for the physical submission (or vice-versa) in a three-dimensional composition using the web-based modelling application, “VRML”. This composition was not limited by any prescribed dimensions, but alternatively, by computing constraints such as file size, and downloading times.

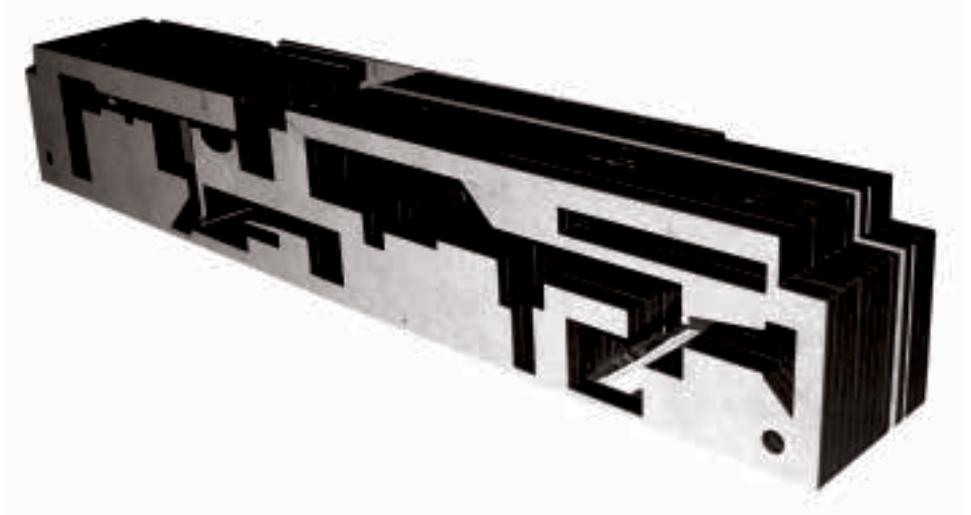
VRML was chosen as the sub-medium for 3-D digital modelling because it offered a medium for exploring both form and narrative in real time that was also portable across the Internet and, hence, easily exchangeable. While a relatively crude, no-frills modelling tool that only provided a “satisficing” solution—in Herbert Simon’s (1969) sense of a sub-optimal but effective heuristic device (Brand, 1997)—to typical student ambitions for glitzy digital imagery, the use of VRML was instrumental in addressing a key learning objective of the course: to immerse and provoke students into a critically reflective “frame of mind”. The limitations of VRML aroused the critical attention of the students to the constraints inherent in all digital media, and to related key issues of representation in design-thinking and professional communication (Scriver and Wyeld, 2003).

### **3. Analysis of Design Projects**

The students’ exploration through physical and virtual representations of the juxtaposition of their chosen designers’ work and/or design philosophies was restricted to a predetermined set of parameters: in the case of the physical submission 100mm high by 600mm long by 90mm deep; and, the virtual 500kb. The physical compositions tended to say something different at each “end”. Whereas, the digital compositions demonstrated the extremes of spatial exploration: from isolated objects floating in a void to fully immersive, visually engaging, spatial tectonics.

From the rigidly geometrical to the more organic, the physical compositions attempted, in craft-like manner, to extrapolate the essence of often just a single idea. For example, in an interpretation of a putative relationship between Herzog and de Meuron and Alvar Aalto, we saw their respective formal languages that foreshadowed the apparent jarring of values between technology and nature by extending the formally geometric juxtaposition with a more organic, wave-like, form. In another example we saw a projection of their juxtapositions beyond the given prism such as, where an ecological response to the shift from Frank Lloyd Wright’s “nature reflected” to its reinvention for generative purposes in Ken Yeang’s “green skyscraper”,—“toyed”—with the notion of a literal ecology of building

materials in the form of tree branches, paper, wire and so on. Then there were those that attempted to meld the essence of their chosen designers' work, in a quirky, tongue-in-cheek manner. In a play on literal metaphor, Antonio Gaudi and Santiago Calatrava are juxtaposed—materiality and form, mosaic and cable (literally a mosaic'd? cable). Finally, on a more serious note, there were those that addressed the notion of the design decision-making process by giving it a tangible form. The importance that both Louis Kahn and Henri Ciriani placed on light penetration in their design decisions was explored in Figure 1. It attempted to represent abstract thought processes in a scaled habitable space.



*Figure 1.* The design decision-making process given physical form (Howard Truran).

On the other hand, many of the virtual compositions showed an even freer conceptualization than what was possible with the physical composition alone. Their virtual compositions could be experienced in “building-like” ways expressed through scale, external form, and internal arrangement. Many were, nevertheless, “self contained” spaces—objects floating in a blackened void—in the sense that all components interfaced with each other as if they were structurally coupled. Clearly, this type of structural construction was redundant in the media.

We saw a virtual composition where the Australian architect, Peter Wilson’s postmodern humour was juxtaposed with a more literal reading of Alvar Aalto’s Finnish forest and folk-tale inspired architecture. Aalto’s search for the legendary tree-type necessary to build a boat is foretold in a Finnish tale. This composition attempted to see through Wilson’s humorous eyes the trees, which in Aalto’s view were the natural material from which the “technological” vessel would be built—represented as a cluster of survey pegs or markers of the enveloping environment and control of civilization, and not of nature. The composition plays on Wilson’s

ideas relating to technology, the modern urban context and the poetic structure within it.

Some of the more “experiential virtual spaces” generated took into account the physical impossibilities of the media. Although often still a contained space, iconic objects appeared as floating reminders in a dreamlike moment captured in stasis. The spaces themselves were constructed to be navigated. On the move, their kinetic aspirations worked *with* the navigator. In one of the animated compositions the effects of balance and symmetry were juxtaposed in the respective works of Louis Kahn and Daniel Libeskind. In particular, animated black and red objects against a white background were used to evoke the cutting and stabbing of the static white objects, reminiscent of Libeskind’s attempts to create a feeling of discomfort and a sense of violence.

From the clearly “objectified” external forms we could descend into the interstitial spaces and begin to “experience” these virtual compositions—the “solid” forms around us simply provided orientation. Such spaces were not simply comprised of objects in a void but pregnant voids delimited by undefined object surfaces. With no clear “grounding” in the traditional sense, some of these compositions provided for the hybrid hyperspace that only a Virtual World could produce. Placed infinitely within their experiential compositions, the very idea of placeness rather than object was most pronounced. As an expansion of the architectural experience outside the phenomenological, we found new “places” in a field of similar objects, which were the context and not the objective. Immersion in the narrative succinctly demonstrated the power of perspective as an immersive tool. In this sense, it transcended the “physicalist paradigm”—creating a spiritual “place” (Wertheim, 1999).

Typical of those that approached Zaha Hadid, Gerrit Reitveld, and Mondrian was the “three-dimensionalization” of their otherwise two-dimensional works. The



Figure 2. The three-dimensionalization of two-dimensional design space (Sam Russell).

solids and voids generated were representative of historical and cultural absences in society (see Figure 2).

Since the task given was the study of architect and landscape architects' work, which tends to be clearly about the construction of space within or around objects, it is perhaps not surprising that few participants chose to pursue these purely *experiential* expressions. In one example, where we saw a horizon simply divided, evoking the notion of void generated by the resultant chasm—a felicitous experiential expression of vastness—most students chose to simply simulate “real” spaces or “objects”. Although the emphasis was on creating compositions which revealed particular insights into a designer’s work (style, form, morphology—climate, humanism, nature, geometry and so on), philosophical underpinnings, or critical era, few were able to capture the essence of this reading of the task and instead generated “models” for which they were more familiar as a production morphology within the *typical* design studio project. This, in a way, gives currency to the notion that analysis of objects, as against the meanings behind their use and interrelationships, is inextricably linked to the perspectival paradigm in which CAD tools are framed. The design thinking and action of current students engaged in such media appear to be conditioned accordingly.

Most of these students were attempting to communicate their understandings of a particular aspect, attribute, or ideology of their chosen designers by inviting us to join their simulated journeys of discovery. The virtual media was particularly pertinent in facilitating richness not achievable with the physical media. It allowed for an infinite array of not only initial design possibilities, but also navigable journeys. In addition to the three dimensions of spatiality, these submissions exploited the further dimensions of time and narrative itself. Although often a scripted narrative, available from the *ebb* submissions, the addition of inflection and intonation to their live speech personalized the spatial “performances”. As an exploration of the possible temporal trajectories offered up by the cultural turmoil that was the twentieth century, these ethereal twenty-first century installations captured the essence of this transitory period in their fleeting expressions.

#### 4. Reflections

The *Twentieth-Century Architecture and Landscapes* course discussed here utilized commonly available technology as a creative tool to offer students stimulating self-directed learning experiences. Students in their final remarks about the course particularly appreciated the multiple modes of communication, interaction, and dialogue that the teaching and learning methodology provided throughout the semester. The vast majority believed the subject had enhanced their search and quest for knowledge. A large majority consistently applauded the discussion board. For them, the main advantage of the *ebb* was that it opens the

mind to many different ideas and views and made them think. There was consensus that the *ebb* had greatly assisted in understanding many concepts in twentieth-century architecture. A significant majority agreed that VRML had been a new experience that inspired much of the creativity. They found the major project not only the most positive learning experience of the course, but also the most interesting.

## References

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