

# Synthetic Pedagogy

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## Introduction

As tools, techniques, and technologies expand design practice, there is likewise an innovation in design teaching shifting technology from a means of production and representation to a means of discovery and development. This has implications on studio culture and design pedagogy. Expanding the skills based notion of digital design from know-how, or know-how-to-do, toward know-for, or knowledge-for-action, forms a synthetic relationship between the skills necessary for action and the developing motivations of a young designer. This shifts digital design pedagogy to a medium of active inquiry through play and precision.

As digital tools and infrastructure are now ubiquitous in most schools, including the increasing digital material exchange enabled through laser cutters, CNC routers, and rapid prototyping, this topic node presents research papers that engage technology not simply as tools to be taught, but as cognitive technologies which motivate and structure a design students knowledge, both tacit and explicit, in developing a digital and material, ecological and social synthetic environment. Digital fabrication, the Building Information Model,

and parametric modeling have currency in architectural education today yet, beyond the instrumentality of teaching the tool, seldom is it questioned what the deeper motivations these technologies suggest. Each of these tools in their own way form a synthesis between representational artifacts and the technological impact on process weaving a wider web of materials, collaboration among peers and consultants, and engagement of the environment that the products of design are situated in.

If it is true that this synthetic environment enabled by tools, techniques, and technologies moves from a representational model to a process model of design, the engagement of these tools in the design process is of critical importance in design education. What is the relationship between representation, simulation, and physical material in a digitally mediated design education? At the core of synthetic pedagogies is an underlying principle to form relationships of teaching architecture through digital tools, rather than simply teaching the tools themselves. What principles are taught through teaching with these tools, and furthermore, what new principles might these tools develop?

The following papers address these questions and suggest many more. In each case, these synthetic pedagogies are structured through the technologies they pursue forming a Digital Material Synthetic and modes of Collaborative Inquiry.

### **Digital Material Synthetic**

In *(Un)Intended Discoveries: Crafting the Design Process*, Luis Eduardo Boza presents a concise history of the tensions between craft and technology. Developed through David Pye's workmanship of certainty and risk, a collaborative approach of "continuous critique and inquiry" is developed to couple certainty and risk in which hand, computer, and digitally-driven fabrication technologies are considered as one tool. This is presented through the design and fabrication of a veil-like space-making device.

In *Digital Design and Making: 30 Years After*, Professor Larry R. Barrow continues his research trajectory of "Design Dimensions" through three case studies documenting the process of an individual design student. He proposes that technology can be presented to any level student opening up design dimensions as the student advances. His focus in this paper is on CAD/CAM form-finding through the exchange between both input and output. He concludes with a multitude of pedagogical considerations.

Martha Skinner's *Audio and Video Drawings: Mapping Temporality* provide an opportunistic loop from the previous papers on place-making and form-finding to the temporal dimensions of understanding place through perception and measure. Using the digital video camera to record activities in time, focus is

placed on revealing the color, texture, and materiality that goes unnoticed in everyday activities such as walking and driving. This objective data is translated through large scale mappings and video drawings demonstrating a sensitive and meaningful understanding of place central to design proposals.

### **Collaborative Inquiry**

Using Wiki's for peer to peer collaboration in preliminary design is presented in *Web Based Collaboration (for Free): Using Wikis in Design Studios* by Mark Lindquist. The assets and limitations of Wikis as an interactive tool are enumerated from the selection of available Wikis, the acceptance and use of the Wiki interface by students, and the role it played in the design process as a design reference.

Developing from their previous work on parametrics, in *The Re-Engineering Project*, Andrew Maher and Jane Burry present a novel approach to develop co-rational collaboration between architecture students and engineering students in the earliest stages of design. Of particular note in their detailed report is their development of the "schema preparation," or designing the design, necessary to establish the constraints which drive the parametric model.

Finally, Dr. Stan Guidera seeks to establish a connection between professional practice and design education through *BIM Applications in Design Studio*. He proposes a reductionist approach to limit the use of software features to align with the specific learning outcomes of the studio. The focus presented is on the structural features in object-based modeling.