The Need for Nimble Thinking

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The digital age demands fluid movement between different modes of thought. At its foundation, research requires patient study, what Malcolm Gladwell[1] describes as the expertise that comes from practicing one thing for 10,000 hours. Careful observation and reflection yield the small insights that lead to bigger discoveries. Through experimenting, designers learn how to do things in an intuitive way, developing a deep tacit knowledge of actions that is hard to express in words.

But this tacit knowing-by-doing needs to be articulated for others to use it, as Donald Schön[2] explained. In the digital world, programming requires expressing ideas in a formal language. Parametric programming requires expression of a form's gestalt with the understanding of what should be adjustable. In CNC technology, the aesthetic intention and desired formal outcome must be translated into precise machine operations such as cutting, bending, stacking movements. Robotic construction's liability potential makes clear communication an imperative.

While optimizing and articulating the steps of a tech-enabled process requires a kind of maniacal myopia, understanding the potential significance of this work requires stepping back to consider conceptual frameworks. For this knowledge to be useful, we need to place the effort into context, framing it so that the general principles can be applied to other situations.

To punctuate a rationally articulated practice, we crave the spark of discovery. The flash of intuition comes when the slowly smoldering embers of methodical study are activated by risk-taking. We want rigorous questioning to make sparks fly, igniting new ideas with heated intensity.

The papers and projects of ACADIA 2011 provide a glimpse into a future where creative sparks will transform our daily reality. By changing the tools of design, our authors are changing what it means to create architecture. Since the first primitive hut, each generation has found new ways to imagine and construct shelter. Creating shelter has depended on the materials at hand and methods of assembly. Now we have a new generation of how craft, process and technology can come together for environmental design.

For example, digital fabrication must bridge between the abstract algorithmic world and the idiosyncratic physical world. The mathematical purity of a parametric model can be challenged by the unpredictability of wood fiber structure, structural loading or fastener dimensions. The rational logic of programming needs to be supported by fast on the feet street smarts for quick response to unforeseen circumstances.

Digital fabrication researchers must examine digital and material techniques with equal intensity. Whether it be fabric molds, 3D-printed concrete or gravity stacked stone slabs,

the designer needs to work in concert with each material's specific character. The designer needs to ferret out what aspects of traditional construction methods are intrinsic to the material and how current practices can be updated or subverted for more efficient deployment, better performance and aesthetic expression. By careful reading of how the material is responding to input, the designer can successfully adapt the digital commands to new conditions.

Our papers on interactive environments, cross-disciplinary integration and other aspects of design process show how today's digital designers also need social and emotional intelligence.[3] Individuals and groups are in a complicated dyad, with seemingly contradictory forces at play. We celebrate the individual genius architect, when we know buildings only get built through carefully coordinated teamwork. Technology enables do-it-yourself individual empowerment, but technical complexity demands team collaboration. We want the freedom of self-publishing on the Web but we need vetting by a group to establish credibility.

ACADIA brings you this publication through the collective intelligence of our volunteers. Our savvy University of Calgary conference organizers attracted strong submissions, culled them with an army of blind reviewers, and edited the top projects to bring you this collection. We bring artful designers, intense geeks, ambitious dreamers, and eager minds together from around the globe to share these products. We want all researchers to acknowledge how their work builds on others' and understand that their work lives within a community of practice. Through ACADIA.org, you can join in a global dialog about the digital future. Please enjoy the fruits of our labors and join us in sparking new ideas online.

Notes

1. Malcolm Gladwell, *Outliers: The Story of Success* (New York: Little, Brown and Co., 2008).

2. Donald Schön, *Educating the Reflective Practitioner* (San Francisco: Jossey Bass, 1987).

3. Daniel Goleman, *Emotional Intelligence* (New York: Bantam Books, 1995).