

### Permutations

In extreme cases, games without space beyond the extents of the boardscape become generic, homogenous, and two-dimensional. While digital making is a necessary process of the game's strategy, it is limited to merely use the digital to make what could have otherwise been made without the digital. Since the game's objective might not solely be inhabitable space, the intention of the game should align with more augmentation, innovation, and experimentation than with replacement as currently presented. The true use of a game in the context of architecture would exploit the seams of the rules, use the digital in imaginative ways, and have assessable consequences and time would have a definable role. The intersection of computer space with architectural space, I believe, would result in active and adaptable spaces that challenge our thinking about observation and perception and enhance our comprehension of the unique relationship between participation, experience, and built form. These in-between seam spaces or stitched-spaces would therefore begin to define an environment within which all students could discover something for themselves and in turn challenge the practice of architecture in the future.

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### Digital Curricula: Effective Integration Of Digital Courses - A Delicate Balance

Nancy Yen-wen Cheng

One of the challenges faced by digital design teachers is how to fit our piece into the larger puzzle of architectural education. How can we make computing support architecture's varied endeavors and thinking modes? Students must be able to explore and communicate design ideas fluidly using digital or traditional media, as suitable to specific queries. We need to expose students to a palette of current and emerging techniques and help them develop a personal set of media skills.

### Resolving tensions in curricular planning

What's the best way to do it? In planning what to teach, we face lots of decisions: architectural problems or artsy multimedia? Descriptive case studies or generative design exercises? Last year's topics or the next big thing? The apparent dualities in curricular planning can be resolved by prioritizing and timing. Rather than choosing one over another, it's a matter of figuring out how and when it fits into a student's education.

I follow Howard Gardner, who advocates different kinds of training for different times in a child's development. In [To Open Minds](#), he looked at methods of teaching music and art in China and America – marveling at the contrast between the rigidly structured Chinese lessons and more exuberant American approaches for teaching elementary students. Consequently, he believes in early free expression followed by several years of apprentice-like training to encourage disciplined, structured learning for pre-teens and young teens. As teens methodically acquire skills, they can gradually move beyond classical exercises and find new modes of expression.

So, in introductory classes, we encourage students to experiment and create 2D and 3D compositions that can incorporate happy accidents. As they get to know applications better, we balance expressive creative projects with descriptive ones that require more understanding of subtle controls. Through projects using architectural precedents or prescribed generative functions, they learn skills that are then applied to developing design studio projects. As students are more aware of the need to present their ideas rather than develop them through media, much of the learning needs to occur in a design context. We want our students fluent and empowered to experiment and discover new design ideas. To check this competency, we can screen portfolios or use timed exercises.

Amid the machines and software, design must remain central. We cultivate visual judgment by starting the palette small and the problems simple but open-ended. In teaching 3D applications, we introduce view navigation and rendering early so that students can bring graphic appeal to even the simplest cubes. As technology is a necessary evil to many design students, I concentrate on strategies for approaching new technology and talk about technical concepts in support of design tasks. Reinforcing technical ideas works best on a need to know basis, with help available on demand.

### Today vs. Tomorrow

A big question is how to keep our courses timely and fresh without pushing the latest thing because the teachers benefit rather than the students. We need to find a kind of dynamic equilibrium: moving forward while keeping in balance. For example, it is important our students understand that architectural CAD programs can quickly generate 3D buildings from simple 2D drawings and that they have the database

structures to link all sorts of building information for cost estimation, structure, etc. into the same model. Yet many of us feel it is more appropriate to start design students on generic form-makers that are not architectural because of the inherent bias for traditional (yawn!) forms that the architectural software contains. We show them the more advanced automated programs only after they understand generic operations. We need to expose the students to the advantages and disadvantages of each approach even if there is not enough time for them to master both.

In our quest to be cutting-edge, we have to make sure that technology doesn't get in the way of education. In pursuing the latest and greatest, driven by our curiosity and our need to publish, we may be pushing new gizmos for which students are not ready, or are not ready to disseminate. Whether it is multimedia, nurbs modeling, generative design, virtual reality, rapid-prototyping, or tangible computing, it can take a lot of patient tinkering to pioneer technical pathways and generate rich examples.

In looking at how to push a research agenda within a professional program, I've found it most rewarding to start with top students in independent studies and research seminars, and then gradually introduce the technology to an advanced class that can generate assistants to teach methods in required courses. With the advanced students, we can test out ways to introduce material and get articulate feedback. Advanced students can create examples for beginning students and act as their coaches.

### **Cultivating change**

Rather than choosing the most technically-savvy as teaching fellows, I look for a combination of articulate charisma, design talent and technical know-how. I need at least one glamorous assistant to help make digital look cool because, to reach fruition, a digital design sensibility must pervade the whole school culture. It is too hard to figure out computers alone: faculty, staff and students need to share ideas and reach outside of the school to other resources. We need full-time faculty with broad knowledge as well as expert adjunct application specialists. A diverse learning community is crucial to making a digital curriculum effective in architectural education

### **References**

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