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Unfolding progress in design education
—James P. Cramer

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Honoring excellence in education and education administration

America’s Best Architecture & Design Schools 2016
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Closing the Knowledge Loop: An Interview with Renée Cheng

The University of Minnesota has created a program called the Master of Science in Research Practice. Students spend time in “Research Practice Internships” jointly supervised by faculty and students on research topics that are identified in a variety of ways. In this interview, architect Emily Grandstaff-Rice talks to professor and associate dean of research Renée Cheng who describes the value of the program, the nature of applied research, connection between academia and practice, and a vision for the future of the profession.

EMILY GRANDSTAFF-RICE:
You have previously written about the current state of American architecture practice as a “broken knowledge loop.” What does that mean?

RENÉE CHENG:
The broken knowledge is a great place to start this discussion. Former University of Minnesota College of Design Dean Tom Fisher has talked about this for years, asking the questions: Why is the profession of architecture not more evidence-based? Why is knowledge held as proprietary? Why, when a client comes to architects, is there not a better baseline answer of saying “I have seen this thing before and here’s the best practices in the field today.” While some architects certainly offer this perspective within their own offices, they don’t necessarily draw from the knowledge and wisdom from other offices because ideas aren’t being openly shared, critiqued and tested.

Think about the type of knowledge loop that would typically occur between academia and practice. Compared to public health, medicine or law, architecture does not have a shared body of knowledge. There isn’t the same connection between academic world and, for example, a clinic or whatever you want to call work in the field. In medicine, if a clinician identifies something that needs research, they don’t necessarily have the time to gather information: they use their academic side of their appointment or their academic colleagues to figure out a research project; or if people in research develop a technique or treatment, they ask colleagues...
about clinical trials or something that would interface with the patient. In this model, there is a feedback loop that allows ideas to originate in either place — academia or practice — each has a complementary role. Tom and I often talk about what a completed architecture knowledge loop could look like because we know there is a lot of applied research that is not shared and also more work that could be done.

Right now, research in architectural practice does not have the same level of literature review or academic standards despite its very high quality. This kind of work hasn’t been influenced by a larger need to share, replicate, reproduce, verify, all of those things that developing a rigorous body of research demands. What we envision is a knowledge loop informed mostly by practice, but we also know that our students, particularly with digital technologies, have a large capacity to build tools that can be used and need feedback on how it can be best applied in practice. In one of our first research practice projects at the University of Minnesota, the head of the architecture school Marc Swackhamer had an inexpensive variably formed panel that he developed through material and fabrication research, but he had never looked into its acoustical application, although he recognized its potential. Though our research consortium, we matched his faculty expertise with a firm and Marc’s research assistant became a research practice intern at a firm that has expertise in concert halls and therefore are familiar with the application of acoustic panels. The student observed a point of frustration amongst the architects regarding the interface to the acoustic model which was limiting their ability to get data. Working with acoustic consultants, the student was able to build a very simple tool allowing the architects to graphically move the point sources and vary the pattern on the wall in a way that would be possible to use Marc’s panels. The end result was a panel variation that could be done inexpensively but with a lot of variability and a tool that designers could actually use. While this example only got to the level of beta development, it is something that could be used by anyone who wants to take the idea and go forward.

Another example is a firm that had a desire to understand better how parametric modeling of façade and sun orientation could work for designers. One of our research practice interns took on the issue, building processes around existing tools. In the case of understanding the effectiveness of a new kind of classroom design, one of our other interns mapped how students moved in the room and how long teachers spend with students in a particular space and compared it to previous programmatic layouts. Knowledge can originate from either academia or practice and if collaboratively developed in term of priorities, this could be a knowledge loop that reciprocates back and forth.
EMILY GRANDSTAFF-RICE: 
*At the University of Minnesota where you teach, you developed a new graduate degree, a Master of Science in Architecture with a concentration in Research Practices (MS-RP). Given that the first-ever class matriculated in Fall 2013, what have you learned so far from this program and what have the unseen challenges been?*

RENÉE CHENG:
So many of the unseen challenges we encountered were procedural. It took a fair amount of time to set up students as employees in local firms. Because our students are a dual status as both employees and currently enrolled students, sometimes they would receive payroll from fellowship stipends and sometimes they were working towards gaining credit. This required tracking hours and making sure that everything was appropriately evaluated and supervised. Tracking was further complicated by differences between the firms internal processes. We had to create robust procedures and decision trees that allowed for a range of different pathways.

Another issue we ran into was trying to figure out how to measure the scope of work within the academic calendar — timing which governs the academic side, but is not a time frame that is meaningful for architecture firms. While some projects run for a single semester, the multi-semester projects sometimes include winter break or summer. Trying to figure out the schedules and scope of work within a given semester or more, aligning the requirements for various fellowships, research assistantships, credit allocation, interim and final reviews has been a challenge. We have developed clear checklists and check-ins for consistency while keeping the process flexible.

I have heard from the firms that we work with that this program has forced them to be clearer about identifying internal research priorities including their own financial investment and ensuring staff access to researchers. Informal processes to identify research topics can work but a majority of the firms realized they benefited the most when they had clear decision making procedures to prioritize strategic initiatives and research topics — and we are now starting to plan several years ahead. At least two firms have told me that they created formal cross-disciplinary councils within their office to best identify research initiatives and queue up future projects. Others have used their strategic plans to guide internally funded research while others have revised their strategic plans to incorporate this partnership. That’s been one great thing about this arrangement; it has given firms a pathway to feed future ideas not just one semester at a time, but in a longer strategic way.

EMILY GRANDSTAFF-RICE:
*Do you provide consulting to the firms in case they don’t have a pathway to identify research needs?*
RENÉE CHENG:
It’s a dialogue with a lot of back and forth. Firms have priorities that are sometimes tied to specific projects or timelines, others that are more flexible. Certain faculty have expertise in areas that align with firm interests like sustainable design, materials, digital tools, and they are interested to work with firms. Students have ideas that firms want to hear also. We are beginning to see connections with some of the research centers in our college with expertise in health or resiliency. We’ve also had a lot of success in publications and have applied for some grant funding jointly.

EMILY GRANDSTAFF-RICE:
You have previously written about an integrated path of licensure and you are doing a unique thing bringing together the academic and professional worlds. How do you navigate the value proposition for licensure amongst these two?

RENÉE CHENG:
Secondly is mentoring of students from both the academic and professional side. Our students have to navigate bridging between the school realm and firm realm with mentors from each side working together on a project — this has given students unique leadership opportunities. Along the way, they gain IDP hours, take exam sections and make progress towards licensure. We see people most excited about growing research within firms and mentoring a new generation of leaders.

EMILY GRANDSTAFF-RICE:
What does research and leadership look like in the next five to 10 years?

RENÉE CHENG:
I see future research as a robust knowledge loop where problems are identified from either practice or academia. I imagine practice issues coming from clients or practice processes or within the building industry to look at things more objectively. This could be across multiple projects or multiple disciplines using resources that universities have access to. For example, we have been working with an office of infomatics that does data analysis, an academic health center, a bioengineering materials group — and there are more groups that we look forward to connecting.

I would love to see consensus in the building industry on topics that need a broad research effort, these could be aligned with faculty and university resources. That is when research
would begin to look a loop where people in a firm would say, “Hey, there’s this topic that’s important and we know something about it, wouldn’t it be great to work with our local university?” or “This university is well known for this particular expertise, we should partner and see what we can do together”.

I could see academia saying, “You know what? We can only take this idea so far. We would really like to work with a firm that does projects relevant to advancing this work...” In this future research oriented profession, profession and academy would have a cultural awareness of each other and a mechanism for to match interest and expertise on topics.

The best possible scenario would be the ability to get funding from those that benefit the most, stakeholders in the building industry, so that the value for this arrangement becomes clear. We have started to see promise in arrangements like this, hopefully this will grow within the next five years. Given what we’ve been able to accomplish in just two years, we are on track to start seeing larger examples of how academic and practice arrangements benefit each other.

On the issue of leadership in the profession, we saw something interesting in our last recruiting cycle for students from groups currently underrepresented in our field who were high recruits for our professional program and many others. Some chose our professional program specifically because it led to the M.S. in Research Practices. They saw its potential benefit to the profession and could see a place for themselves in it. Imagine if a program like this begins to attract women and people of color and provides them an extraordinary leadership and mentoring opportunities — it’s a different way to rise through a firm. We have seen our research practices students get tapped early in their careers to run research initiatives within their offices. One of them directs research in their office. Another has jumpstarted a public interest design initiative recommending policy for an entire firm. While these are very competent graduates who would have likely risen to leadership within five to 10 years, they are being tapped right out of school.

I find this earlier access to leadership encouraging and it has the potential to diversify the profession. If we can use this as a way to recruit high-achieving students from currently underrepresented groups, we could have a path towards leadership that could be pretty extraordinary. Imagine when our students have graduated with a license and direct experience in advancing a firm’s strategic priorities, having presented their work to firm partners multiple times over the course of a couple of years. They also will have excellent connections with faculty that are networked with other faculty nationally. These are amazing students, and they have the chance to develop and prove their abilities to lead.
EMILY GRANDSTAFF-RICE:
In 2007, you were quoted in Architect Magazine as saying, “Success is creating something really great, whether it’s a family, an educational opportunity, or a building, and making it with integrity, beauty, and joy.” How do you describe success for your students? How do you empower them and change their expectation of what their potential impact can be?

RENNÉE CHENG:
One of the members of the Consortium for Research Practices told me a great story. Recently he took one of our students with him on an intensive workshop because based on previous research practice internships he knew that this student could quickly visualize data. They met with a school board who thought they were going to have to build 17 new schools at the perimeter of their community at great cost to the district, based on data they collected. The student was able to take the same data and with direction of the partner, create really compelling graphics that showed that the district could meet their needs by redistributing and strengthening its core, building five new core schools and renovating five other core schools — the associated student transportation impacts and overall cost was far less expensive than the original plan. The board was blown away because the student used the same data and visualized it differently. This student at one time had more conventional ideas of what an architect does, but now understands that a designer’s data visualization can impact future planning. While experience on construction documentation of a high-rise building is still valuable work, this story shows that designers’ success and impact can be as broad as we want it to be. It also shows that our students and recent grads are capable of extraordinary things. We as educators and mentors need to find ways to connect with them, support them and, perhaps most importantly, get out of their way.

Emily Grandstaff-Rice is an associate at C7A, based in their Cambridge office. A graduate of Rensselaer Polytechnic Institute and Harvard University, Ms. Grandstaff-Rice was the recipient of the 2008 AIA Young Architects Award.

Renée Cheng is a graduate of Harvard’s GSD and Harvard College. A registered architect, her professional experience includes work for Pei, Cobb, Freed and Partners and Richard Meier and Partners before founding Cheng-Olson Design. She taught at the University of Michigan and the University of Arizona before joining the faculty at the University of Minnesota.