Paper Title

An essential tension: the changing space between practice and academia in teaching design research

Bio and affiliations

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Abstract

This paper investigates the modelling of a collaboration between academia and architectural practice whereby students rehearse and re-examine processes of architectural change. It presents a case study of a studio-based design project aimed at transmitting the tacit design research employed in architectural practice into architectural education. The pedagogy advocates a critical tension between practitioner-researcher and academic to demonstrate an iterative process of making, critique, consensus and remaking.

The project – Ch-ch-ch-ch-Changes – invited students to adopt the design processes of an award-winning New Zealand practice, replicating the firm’s office layout around a shared table on which card models are repeatedly assembled and critiqued. Crucial to developing the teaching programme was the practitioner’s articulation of his vision of design – an iterative process in a dynamic, rather than fixed, context raising the question of when, if ever, can we really say architecture is finished.

The interpolation of this vision into a 12-week teaching framework provided students with separate areas of a connected site on which they responded to prompts for change by making and presenting six iterative designs. The process required students to record and analyse how their designs evolved - whether through altered context, planning, form, usage, external space or other means.

The co-teaching collaboration produced a programme of deliberate uncertainty. Students didn’t know what change was coming next, not unlike what happens in practice. Analysis of the teaching process revealed how the model-making milestones were vital to students understanding how design is invigorated in the act of predicting, reacting, remaking and self-critique. The frequent critiques provided ongoing interrogation of the design process and demonstrated pivotal points of tension, difference and consensus between practitioner and academic.

The process created a space for students to engage with unpredictability and, through the regular ongoing critiques, revealed and communicated aspects of tacit design knowledge.

Introduction

The proposition that change and uncertainty shape and animate not only the design process, but also the entire lifecycle of the built environment is at the heart of the Ch-ch-ch-ch-Changes studio design course first taught at the School of Architecture and Planning, University of Auckland, in 2017, then repeated in 2018. This involved two of this paper’s co-authors, academic Chris Barton, and practitioner Jeremy Smith, co-teaching a studio. The idea to
examine how change might affect design teaching is informed by Smith’s current PhD by Practice. His research argues that while the architect’s practice achieves a close relationship between building and landscape when the landscape is controlled and kept constant, when the landscape changes rapidly or catastrophically, such events highlight how existing practice fails to prepare for an outcome in relation to time. In short, it recognises that neither buildings nor landscapes ever stay the same. The research suggests architecture students in New Zealand are taught to finish buildings and architects are legislated to finish them, otherwise Councils won’t issue Code Compliance Certification. The practitioner argues architects rely on repeatedly refinishing the landscape to negate the need to change buildings – a metaphorical, but also often actual, mowing-of-the-lawn around buildings.

Change and time are central to Smith’s research. It shows, through case studies and precedents, that design outcomes generally fail to engage with shifting landscapes in rural settings due to a successional methodology that reifies the concept of finished landscape and buildings. He suggests that model of architectural practice is in itself exhausted, out-of-date, finished, and proposes a new approach where buildings are in an ongoing state of being finished and remain unfinished, like their landscape. The proposed new approach is described as soft architecture – architecture that’s malleable, not necessarily multipurpose, but with adaptation embedded into its DNA and able to participate in shifting landscapes. A building might be quick to change but to be soft it must participate in the landscape as might a river (with the ground influencing the way the river flows, and, in turn, the river affecting the ground). It’s a two-way relationship, a dynamic ongoing exchange. The process, he contends, is no different in city landscapes, where the contexts buildings receive from their surrounds do not stay the same. Nothing is new for long and, as New Zealand’s cities become more intensely developed, our buildings continue to be built as if they will remain finished. They are, in fact, continually responding, weathering, degrading, and practice relies on buildings being maintained and refinished.

**Teaching Change**

To bring the idea of change and uncertainty into an educational context required a radical shift as most studio teaching at the Auckland School of Architecture and Planning follows a successional teaching schedule leading to finished output at the end of 12-week course. This was disrupted by dividing the course into six outputs, one every two weeks, requiring students to present a design that iteratively changed at each of six hand-ins over the 12-week period – physical model, drawings and an evolving three-minute slide presentation visually documenting design changes of each iteration.

The idea draws from Juhani Pallasmaa’s writing about relationships between change and time. Combining research and practice, suggests Pallasmaa, establishes “a dialectical tension between theory and design practice instead of a casual interdependence.” Research affects practice, and practice affects research, but the two are often divergent disciplines in New Zealand. Shifting architectural models to prepare and respond to change more readily requires testing ideas in a format where the timeframes to change can be readily explored and analysed.

The 12-week studio course provided a way to speed up time, with each week notionally representing a 10-year time-lapse in the life of the city. In doing so, the process replicated practice with designs and constructed buildings constantly undergoing change and facing new challenges. Students were introduced to these ideas through an introductory presentation by Smith which traced the history of a holiday house designed to occupy a
forest, but which found itself in a clearing following a cyclone. Bach with Two Roofs (see Figure 1) not only needed repairs but it needed refinishing for, as Smith showed, without the moderation of the forest the sun was hotter, the wind stronger and privacy had gone. The new work required a change in methodology to allow the buildings to be iteratively refinishing as a new forest grows around them. Photos of the work graphically demonstrated the need for buildings to change.

This was an important start for the students and showed how the concept of designing for change worked in both practice and theory. Bach with Two Roofs won World Villa of the Year at the 2017 World Architecture Festival and forms a key part of the practitioner's doctoral research. Smith then introduced key texts, case study buildings and ways of considering change in architecture, including the work of Japanese Metabolists and Void Metabolists, landscape urbanists and further larger public projects from his practice.

Figure 1. Bach with Two Roofs in forest (2007), after a cyclone (2014), in a clearing after the clean-up (2014), refinishing to a clearing (2016) and projected into forest again (2016?). Images from left to right.
Smith’s methodology draws on creative practice research by Richard Blythe in J.Moloney et al’s *Perspectives on Architectural Design Research*², and particularly Blythe and Leon van Schaik, amongst other examples, in Murray Fraser’s *Design Research in Architecture: An Overview*³, both of which marry various design research methods from the work of both researchers and practitioners. Within this broad field, Peter Downton and Van Schaik drawing from Rockmore’s epistemological viewpoint, where knowledge is created rather than discovered as an objective truth, are particularly influential in defining this design research methodology. It provides the basis of the alternative methodologies presented in the practitioner’s research, where architecture results from shared understandings rather than social isolation¹, which has particular reference to New Zealand given its geographic and historical isolation and the “man alone”⁵ ethos that haunts the early and mid-twentieth century psyche of its literature and art.

The challenge was to build a studio design course that would show buildings could be soft, malleable and prepare for change in city landscapes. It would require a context where students’ designs couldn’t rely on their neighbours remaining unchanged. What was needed was a state of flux, an ongoing building project where the urban fabric expanded and contracted all the time. Change would be the only constant. In such a context, buildings would have to change and their designers would need to establish strategies for doing so without knowing what was coming. Whether pre-emptively or reactively responding to shifting contextual relationships through function, program, size, or just time, the strategies for change would demonstrate an urban context that could be considered, and even designed, to be unfinished.

The academic teaching with the practitioner selected an existing urban context with a series of adjoining sites notionally created (Figure 4). Here, amidst a strip of existing heritage buildings, students would be allocated a site by ballot and then design a building of their own choosing – the only requirement being that the design must incorporate a strategy for change and that they couldn’t expect their design to stay the same.

Changes were then sprung on students every two weeks as roadblock challenges, with designs needing to change to participate in the shifting city landscape around them, be it changing context, change of use, an earthquake destroying the heritage buildings, or adding additional area or occupancy loads. Each change is seen as an opportunity for students to improve their designs and test their strategy for change in much the same ways as the practitioner does in his practice.

The process is iterative and sequential, with the project’s key ideas being used to critique pressure points, and to look for opportunities at each roadblock regardless of whether the building is being designed, constructed or used. As Smith described to the students, learning how to look ahead in the design process turns change into opportunity. Figure 2 shows the itinerary for change with its weekly design milestones and roadblocks and Figure 3 compares the studio teaching process to Smith’s practice.
Week 1 model existing. Week 2 design anything.

**ROAD BLOCK**

Week 3 change in relation to neighbours.

**ROAD BLOCK**

Week 4 each project has their use changed. Week 5 change in relation to neighbours.

**ROAD BLOCK**

Week 6 an earthquake demolishes all the heritage buildings. Week 7 change in relation to new open space.

**ROAD BLOCK**

Week 8 change in relation to new context. Week 9 change in relation to neighbours.

**ROAD BLOCK**

Week 10 add another 25% floor area or occupancy. Week 11 change in relation to neighbours. Week 12 hand-in is just another moment in time.

Figure 2. Ch-ch-ch-ch-changes itinerary for change.
Pedagogy in Practice

From a pedagogical perspective, the idea of deliberately introducing uncertainty is not as radical as it might sound. As Kester Rattenbury, writer and Professor of Architecture at the University of Westminster, points out, schools of architecture often deliberately structure risk into their design projects. Far from being as reckless as it seems, Rattenbury argues such risky strategies are essential for “teaching people to improvise, productively and well, and in detailed, complex, developed form, given unpredicted variables.” In other words, “to work actively with situations which are inherently not predictable”. But she recognises an inherent contradiction also acknowledged in the practitioner's research: “Professional legislation of all kinds increasingly tries to nail down every circumstance of building and teaching. But real architectural conditions are always non-standard. They always have vast numbers of variables — practical, aesthetic, human, chronological, economic, you name it — shifting in relation to each other all the time.”

Recognising this contradiction and deliberately embracing a teaching strategy for change littered with risk signalled the beginning of a collaborative process between academic and practitioner that became integral to the teaching process. It began as a dialogue, first to establish the architect’s design process and then to translate that into a teaching programme incorporating the essential idea of change and uncertainty in design. The idea parallels Rattenbury, (referencing Neil Spiller and Nic Clear, Educating Architects: How Tomorrow’s Practitioners Will Learn Today) – in particular her view of the opaque nature of both design and its teaching: “Design is a peculiar skill set: highly sophisticated, powerful, widely used, rarely explained or even understood. And design teaching is a really major part of this surprisingly uncharted territory. Indeed, it is
a core aspect: where we start developing, and how we pass on, our powerful, rarely defined sense of what architecture is, how we produce it and appraise it." Later the dialogue became an open-ended conversation in front of the students at both the individual and group critiques of the students’ designs – a back and forth banter between academic, practitioner and student to tease out the tacit aspects of the practitioner’s practice and knowledge. The practitioner might say: “It is hard to know what to do here – you don’t know what is coming. In practice you are always trying to look ahead. Can you see that by doing this you are setting off on this path? Is that where you want to go? Is that the best way to test your idea for change?” It was a process of showing, rather than telling students about design research. Rattenbury provides some context for how such a “teaching in pairs” model arose. Such studios, she says, are usually led by two tutors, (often a combination of practicing architects, other designers, or academicians), which inevitably leads to debates and arguments between them. “This conforms with research where creative design is actively helped by the individual’s ability to define their own position in relation to two other people’s views. But so far as I know, teaching pairs is a formula which has evolved through trial and error.”

The initial dialogue established that the architect designs and responds to change by analysing from a founding question that sought a close, dynamic relationship between building and landscape as its answer. “We work most of our projects back to a question,” says the architect “…critiquing what we are doing as a way of staying honest to the original intent.”

It is a position where epistemological discussions are as much process as outcome, with no single creative research path. As Downton puts it: “designing is a way of inquiring, a way of providing knowing and knowledge; this means it is a way of researching.” The methodology is therefore a process of discovery, reflection, analysis and improvement, or in Atelier Bow-wow terminology, “transductive.” The process also draws from James Corner’s placement of landscape urbanism into a reflexive methodology with “field diagrams or maps describing the play of these forces… particularly useful instruments in furthering an understanding of… events and processes.” The practitioner might prompt, “What do you think is going to influence your building? What type of change are you preparing for?” In this way, as Downton asserts, making becomes a “way of knowing.”

Translating such heady design research theory into teaching practice occurred in surprising ways, in moments of tension or slippage between theory and practice that revealed mechanisms of tacit knowledge. The first slippage revealed was in the iterative model making process at the heart of the architect’s design practice, involving a relentless critique and remaking of iterative card models. The teaching studio emulated this practice with a central table (Figure 5) where students’ models were displayed and critiqued each week.

The table provided a central means for observing student progress, but was also a place of interaction between the students as they watched new designs arrive and contemplated what affect it would have on their building. From the academic’s point of view the table brought together each student’s individual design into a shared context. This was notably different from other studio teaching Barton had engaged with where students generally worked from a common design brief, each evolving their own design solution separately. But here it was impossible for their design to exist in isolation.

The tacit use of iterative physical model making in the architect’s practice relates to ideas of authentic representation of the design. The process acknowledges drawings – plans, sections, elevations – as necessary to make the model, but sees them secondary to the physical model itself, as though it
provides closer access to the yet-to-be building. Robin Evans argues that preliminary sketches and maquettes are much closer, more connected, to finished painting and sculpture than a drawing is to a building and that the drawing, rather than the building is the “real repository of architectural art”\textsuperscript{16}. The practitioner’s design practice places great weight on the model as the repository of the design. Models, he suggests, don’t lie and are easy to understand. A model doesn’t allow cropping of an image or changing the field of view.

![Figure 5. Students piece the model together and then analyse and record the week’s changes around their building. (2017 studio top, 2018 studio bottom)](image)
The shadow cast in a model is the shadow cast in the real building. This representational process was developed further in the teaching process with students encouraged to photograph their models and then, rather than create renders, use Photoshop to massage their photos to create perspective views, (Figure 6) of their designs as it changes each week.

It was essential that this photography included the surrounding context and the other student’s designs to show the city landscape changing continuously – hence the need for the centralised table for the site model on which designs were placed in relationship to one another (Figure 7).

Figure 6. A 2017 student’s perspective image developed from a photo showing other students’ models as the cityscape and which was updated (left to right) along with the cityscape over six hand-ins.
Figure 7. Contexts and environments continually shift as students work develops each week and they face, and respond to, change. One week a view, the next week a neighbour changing the outlook. (2017 studio top, 2018 studio bottom)
Essential tension

The most significant tension in the teaching process occurred during the weekly critiques of the students’ works-in-progress when practitioner and academic were both present. Every second week this would occur as a group critique when each of the 16 students in the studio presented their latest design. The routine established a regular three-way conversation between student academic and practitioner – a show-rather-than-tell process where the student was encouraged to argue. “What do you think? Push back – disagree. Stand your ground,” were frequent refrains. The underlying pedagogy here is that design is largely learned through a curated process of doing. That includes a group dynamic – students watching others design, and seeing for themselves how to distinguish what works from what doesn’t. Attending and participating in the feedback is how both students and tutors learn.

The milestones also provided a convenient assessment tool to provide feedback on student progress. At each design presentation both academic and practitioner would assess the work on a UDAM (Unacceptable, Deficient, Acceptable, Merit) scale and then compared assessments. These were then combined into a single assessment providing a useful means of recording student progress over the 12 weeks. At the halfway stage students were given written feedback which included their three assessments on the scale. The final grade was comprised from the six UDAM grades. For the academic, this was a significant departure from previous studio teaching where the student’s final grade was mostly derived from their final presentation in Week 12.

A key to the process was ensuring each time a student’s model was critiqued that it was done in relation to the student’s description of their strategy for change. At each iteration students were encouraged to explain and improve their strategy for change in their presentation of their new design. Eg: “My idea for change is to establish a building which generates ways to change through its porosity in relation to how buildings grow around it. Because of my neighbour adding this additional area, my building has responded like this.” While that included usual advice and suggestions of how to improve the design in relation to aspects such as circulation or space planning, it also involved comparison to what had gone before – i.e. the previous week’s model.

The characterisation of a dynamic reflection model where the past is not fixed, but remains in flux and becomes altered by each new project whether notional or real parallels Fraser’s “two-fold movement” creative components. The process includes critical examination of theory and architectural works, and “both doing and reflexive” analysis of design work. Pushing students to look back at their previous designs and self-critique whether they had improved in relation to their overall design concept, including their strategy for change, created a frequent stream of “what-if?” questions. Here the practising architect would often take parts of the model and move them or hold up pieces of card to demonstrate the effect. On other occasions the academic teacher would, when a particular unresolved design issue had been recognised, prompt the architect to describe what he would do in his practice to resolve the problem. In one instance, this involved suggesting a student remake parts of her model in different materials to show the effects of opaque, clear and translucent panels (Figure 8).
The “try it and see” response became another regular refrain in the critiquing process. Inevitably, this led to tacit aesthetic judgements. Here, using their model, students could explore options. The architect would ask, for example: “What do you prefer – your design with the stair here (externally) or internally (removing the external stair)?” On such occasions, the student was asked to confront the consistency of the design concept. The architect would ask questions like: “Is that the same language (pointing to a design element on the model that might indicate a new direction)?” Or (looking closely at a floor plate of a model): “Use your design eye here – you have a way of managing gaps in the building. Do you want it to read as one, two or three buildings (Figure 9)”
The process fits with Blythe’s field of “fascinations” — that is, the broader referential framework of the community of practice where the designer can be located and contextualised — and also key tropes that the practice returns to again and again. Blythe states: “What is the exedra to the specifics of individual projects that orients the designing and defines its intent, acknowledging that this intent may well remain tacit? The urge, then, is what drives the designer; and this urge defines, to some extent, the emerging line of inquiry that runs through the practice.”

Conclusion

This method of critique intensifies engagement and argument about design between student and teacher, pushing the academic to critically interact with both the practitioner’s and students’ strategies for change and adaptation. Each design presentation critique also involved evaluation, providing a successful feedback loop between teacher and student and proving a means to assess the ongoing process of design rather than the finish product. For the practitioner the student work provided a way of testing various approaches to designing for change which is difficult to achieve in practice. This dovetails into the design research that has emerged in recent years from the RMIT model – loosely described by Rattenbury as a branch of research that sets out to research architecture’s own native design processes on their own terms. “That means developing research terms and methods by building up knowledge of existing design processes that we are already using – rather than adding on some other discipline’s framework.”

The Ch-ch-ch-ch-Changes studio provided a way for the practitioner to hone his own research, to extract and analyse his own tactics – the way he used models, presented to clients and other aspects of what happens in his practice to generate a design. It also provided a vehicle to articulate, communicate, describe, test and improve his thesis – in particular providing validation for his notion that city buildings need repeatedly to change. In summary, this paper suggests four possible enhancements for design teaching that may help reveal tacit design knowledge. The first is the iterative making process formalised in six changing design outputs over the 12-week course and the second is the six iterative critiques of those outputs in a group context. The paper suggests a more regular interrogation of the iterative
system of design is important because it’s out of those tactics that architecture has itself evolved its own unspoken, tacit methodologies for design. More regular making and more regular critique of the making, as if to make it second nature. In other words for both architect, academic and students, practising, provides a strong vehicle to bring those latent design methodologies into the light.

While the critique or “crit” is a regular feature of studio teaching at the Auckland School of Architecture as a means of continuous improvement of student designs, it’s also used as an assessment tool, particularly at the final crit where students may hear about the failings of their design but have no opportunity to address them. This studio argues for crit as a tool of continuous improvement and as an integral part of design practice. By modelling a regular three-way dialogue between academic, practitioner and student, (with its attendant agreements and disagreements) the teaching aims to engender a process of self-critique for students to harness in their own design methodology.

The combination of roadblocks and the relentless schedule meant students were regularly repeating and improving the presentation of their design arguments for the way they showed change and how they expressed their strategy for change. The repetitive nature of this inevitably lead to a honing of oral and visual communication skills and instilled confidence in students through visibly improving how they described their work. Practising makes perfect.

The fourth enhancement is setting up the studio around a large table on which the model is placed as a shared resource. This mirrors how Smith’s practice is set up with work spaces circling a very large and long communal table where critique, discussions and modelling takes place and where everyone can be involved. In the studio this meant the students could watch and learn from each other’s progress as their designs evolved. It also provided a highly accessible platform for critique, plus a means to watch a segment of the city grow, adapt and develop in unexpected and delightful ways.

The significant difference to note here is, compared to studio teaching where students may similarly make models to communicate their design intentions, that they are often doing so in response to a shared brief or design problem. Here the individual designs are all pursing their own brief but through the central table come together in a shared context affecting one another. With nowhere to hide, the designs are forced into conversation with one another.

The benefits of this type of studio was particularly evident when comparing the differences between the 2017 and 2018 students’ designs. Both groups designed on the same site with the same brief, but produced vastly different cityscapes (Figure 10 and 11). It’s clear that cities change as a collective, with one building change influencing its neighbours, and the process vividly demonstrates how buildings must be prepared for change. When shown the previous year’s model at the end of the course, the 2018 students were interested in what had driven the 2017 studio to such a different result, but weren’t surprised that the outputs were so different; cities develop iteratively from many different decisions, they suggested.

As the practitioner suggests of both practice and architecture, and the academic of teaching design: “Being finished is finished.”
Figure 10. 2017 Ch-ch-ch-ch-changes Studio Week 12 model and weekly iterations.
Figure 11. 2018 Ch-ch-ch-ch-changes Studio Week 12 model and weekly iterations. Vastly different cityscapes develop from the same brief and students responding to each other’s designs showing that cities develop iteratively from many different decisions and changes.
1 Juhani Pallasmaa, Encounters: Architectural Essays, ed. Peter B. MacKeith (Helsinki, Finland: Rakennustieto Oy, 2005), 237.


5 John Mulgan, Man Alone, London: Selwyn & Blount 1939


7 Ibid, 60

8 Ibid, 61

9 Ibid, 65


14 Ibid, 28

15 Downton, Design Research, 98.


18 Fraser, Design Research in Architecture: An Overview, 217.

19 Downton, Design Research, 98.
