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Critical thresholds.
Traversing architectural pedagogy, research and practice

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When a "teacher" and a "student" collaborate on a project without being preconditioned by any *apriori* definition of their respective roles, the relationship of initiative and power that is revealed in the master/pupil intercourse may well be inverted. The same is true of collaborations between professional "experts" and "the public", the latter often outperforming the former, not only because members of the public often have a more intimate understanding of local conditions but also because they may, quite simply, be smarter and more qualified to take decisions.

The global setting requires us to question and redefine critical thresholds, especially those distinguishing pedagogy, research, and practice. This collection of essays – with an introduction by noted architectural theorist Colin Fournier – is structured around three alternative architectural education themes: Interdisciplinary and Collaborative Projects, Live and Interactive Projects, and Situated and Community Projects.

The conclusions that emerge identify trends that can be considered to be early symptoms of the positive changes that are taking place within academe, at many different levels, with respect to design education. Taken together, they clearly lead to an understanding that the design world is in a process of mutation, with greater emphasis being put on collaborative practices, including multidisciplinary collaborations and live projects, but also on the greater impact that new generations of digital computing and manufacturing tools are now having on designers.

TABLE OF CONTENTS

Cover images: FESTA Festival of Transitional Architecture in Christchurch, New Zealand.
Credits: (top right) University of Auckland School of Architecture and Planning, *Orbis*, CityUps,
FESTA 2014. (bottom right) Unitec Architecture Dept, *Influx*, CityUps, FESTA 2014. Photo: Erica
Austin. (top center left) University of Auckland School of Architecture and Planning, *Antigravity*,
(top center right) CityUps, FESTA 2014. Photo: Bridgit Anderson. Photo: Erica Austin. (top left)
Lonnie Hutchinson, *I Like Your Form* lit by Gap Filler for FESTA 2014. Photo: Erica Austin.
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EDITORIAL

Critical thresholds.
Traversing architectural pedagogy, research, and practice

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It is significant that the AASA – Association of Architecture Schools of Australasia (https://aasa.org.au) conference on "Applied Collaborations" took place in Christchurch in the Fall of 2015, not long after the earthquakes that tragically destroyed a major part of the city. Although the physical devastation was extensive and highly traumatic for the inhabitants, it was encouraging to observe that, after an initial phase of shock and paralysis, came an optimistic period of quasi euphoria, a revolutionary spirit, a sense that the city could be radically reinvented instead of being rebuilt merely as a faithful replication of the past.

Rather than aspiring to a reinstatement and perpetuation of the status quo, it was felt that it could emancipate itself from its colonial past, become a better city and, most importantly, that its rebirth could call upon the energy, enthusiasm, self-motivation and generosity of all its inhabitants and truly involve the participation of the community as a whole.

The city, while still licking its wounds and clearing up the debris, went through a vibrant period of recovery and utopian dreaming, a phase when it was felt that anything was possible, that not only could the urban fabric and its supporting infrastructure systems be radically changed but that its governing institutions could also be transformed, as well as the fabric of society as a whole. It was felt that this unique opportunity had to be seized before it was too late. The time had come for a major urban and social mutation.

Although the AASA conference took place several years after the tragedy, the urgency of this pressing original call for collective action of a radical nature could distinctly be felt, albeit with different degrees of intensity, in the interventions of all speakers. The damaged city clearly was, directly or indirectly, the most significant historical and political fact informing the presentations and several of the case studies that were presented were indeed specifically related to the highly innovative community interventions and creative designs that sprang up in Christchurch after the disaster.

In the light of these circumstances, the agenda of the conference called for a critical re-examination of design practice, based on the evidence of applied projects. Three distinct types of responses were made: in urban design and master planning, calls for greater

community participation and a focus on local bottom-up initiatives; in professional practice, calls for more social engagement and responsibility; in design education, calls for a strong emphasis on "learning by making" and particularly on hands-on "live" projects fully engaged in the problems of the real world, in collaboration with professional design practices, builders and members of the community.

The emphasis on radical experimentation which was prevalent at the AASA conference also has to be seen within the context of what is happening worldwide and not just in Australasia: pushed by profound cultural and geopolitical changes as much as by technological advances, design education as well as professional practice are globally going through a period of rapid evolution. The message that clearly came across at the event is that this evolution could lead to a major paradigmatic shift.

The contributions that have been included in this publication originated from the discussions held at the conference in Christchurch. They are extremely diverse and have been grouped into three distinct chapters, with quite extensive overlaps between them. Comprehensive summaries are given as to the contents of each chapter, so this general introduction is not intended to analyse individual contributions, but rather to highlight the key recurring themes that emerge, in forms that vary from author to author, from the document as a whole.

On the changing nature of collaborative practice

As several authors point out, we no longer believe in the myth of the designer as solitary genius. Despite the anachronistic survival of the "Starchitect" phenomenon, still promoting an elite of global brands, it is now generally understood that design is a collaborative process involving many participants, including, in various mixes, professionals, educators, students, clients, users and the general public.

This understanding of design as collaborative practice has become commonly accepted and would hardly be worth repeating, were it not for the fact that beyond this change of perspective lies a radical set of deep transformations that are now taking place: what is a stake is not just a quantitative shift of emphasis from singular to plural authorship, but a comprehensive philosophical, social and political reappraisal of the roles performed by different players in the process of design.

As is shown in several of the case-studies, when a "teacher" and a "student" collaborate on a project without being preconditioned by any a-priori definition of their respective roles, the relationship of initiative and power that is revealed in the master/pupil intercourse may well be inverted.

The same is true of collaborations between professional "experts" and "the public", the latter often outperforming the former, not only because members of the public often have a more intimate understanding of local conditions but also because they may, quite simply, be smarter and more qualified to take decisions.

The examples given of various applied collaborations reveal, case after case, that the conventional categories normally used to identify the layering of responsibilities for different players taking part in a design project have, in the past, often been biased, condescending, erroneous and are therefore now largely irrelevant and obsolete.

In other words, true instances of collaboration with "the other" lead us to question all professional hierarchies as much as gender and racial distinctions, cultural preconceptions

and, ultimately, the social order itself. When taken seriously, collaboration opens up a Pandora's box and is, consequently, a highly political experience.

What the authors also demonstrate is that we collaborate not only with other people but also with objects and, most importantly, with the tools we use. As designers, having finally abandoned the parallel rule and the set square, we now collaborate mainly with software programmes, keyboards and computer screens. Digital tools open up on these screens vast realms of virtual collaborations, on a worldwide basis, that far exceed, not only in terms of numbers, but in terms of quality of information and potential impact, the contributions of the few flesh and blood people that still surround us in the workplace.

One can therefore no longer talk of collaboration without addressing the omnipresent digital partner. Here again, the difference is not merely quantitative: it is a fundamental difference in kind. Collaborating on a design and manufacturing project with an indefatigable robotic device that is far more powerful, precise and versatile than a human being is an experience that totally changes the nature of the task as well as the meaning of collaboration. Even more importantly, collaborating with an artificial intelligence that has not only immense resources of memory and processing power at its disposal but also cognitive abilities that will soon be far superior to ours, are the new challenges we have to face.

Up to fairly recently, we used to consider, somewhat naively, that computers were good primarily for repetitive tasks and humans for creative ones, but this conventional preconception is now seriously in question. Just as the nature of the master/pupil collaboration, as we have seen, is in question, so is that of artificial intelligence versus the human brain.

Paradoxically, collaboration with robotic devices and AI, by immensely expanding our capabilities, challenges our initial critique of the solitary genius and could turn the old metaphor of the "one-man orchestra" into a serious possibility.

On the object of collaborative work and on reality versus fiction

In cybernetics, the "law of requisite variety" states that any system used to control another system must have at least as much information "variety" as the system it seeks to control. Therefore, large design projects and particularly city planning projects require large multidisciplinary teams in order to match, within their own structure, the complexity of the universe of discourse they have to address. In such design contexts, collaboration is called for as a matter of necessity.

However, in terms of content, virtually all the applied collaborative projects described by the authors in this publication are small "live" projects, usually ephemeral and requiring limited funding. Most of them are light-weight pavilions, temporary performance spaces and prototypical micro-dwellings, such as the excellent designs entered for the solar house competition. All these designs are fascinating and some of them are brilliant. They have been extremely successful exemplary projects, fully adopted by the local communities for which they were made, communities which, in many cases, actively took part in their conception and realisation.

Despite their small size and short time frame, they constituted, in effect, microcosms of the collaborative experience, involving the participation of residents, teachers, students, local tradesmen, builders and manufacturers, shopkeepers, NGO partners, fund raisers, etc. They cut through all the traditional boundaries and constraints that usually plague

design projects and provided an accelerated experience of what it means to get something done collectively, quickly and successfully, blurring the customary distinction between conception and execution. As such, they were an invaluable learning experience for all concerned.

But, as the authors soberly point out, one also learns about their inherent limitations. As soon as these projects attempted to go beyond the limited scope of their initial terms of reference, as soon as they grew in size and started aiming for long term impacts and larger budgets, they invariably got either aborted or diverted away from the ambitions of their original agenda.

The students, their teachers as well as other participants, all highly engaged emotionally and encouraged by the extraordinary initial success of their incursion into the alleged "real world", suddenly got confronted with a brutal reality check, as if it had all been a dream. As soon as real money and responsibility came in, as soon as longer term interventions were proposed, the group dynamics were taken over by the pragmatics of bureaucracy and "business as usual". The enthusiastic revolutionary spirit of the commons, discredited by the powers that be or undermined by the participants' increasing loss of confidence in their own power, eventually lost momentum.

The moment of truth is bitter. This certainly does not invalidate the live project as such, but there are key political lessons to be learned from these experiences, particularly the fact that practices that are critical and aspire to become movements of resistance against the status quo must ensure that they are not marginalised and given token signs of acceptance through minor distractions. They should not limit themselves to small projects but aim at building up collaborative teams that are robust and durable enough to compete with large commercial firms in tackling large commissions.

There is also a broader point to be made concerning the pedagogical value of "live" projects, which concerns the relative importance given to reality and fiction in architectural design education. The claim is that live projects offer the students a "taste of the real". However, quite apart from the fact that these experiences in social realism remain, at best, on the fringes of reality, one has to face the more philosophical question as to whether, in an educational context, there is more to be learned from reality – assuming that there is such a thing - or from fiction. One must be very careful not to discredit the importance of fiction, of the imaginary narrative, as a way of exploring the universe of possibilities that lies before us: fiction, including science fiction, as pointed out by some authors, is an extremely powerful tool of the imagination that may be just as effective, if not more, as a confrontation with what may turn out, in many cases, to be merely an illusion of reality.

On learning by making (LBM)

The live project is already, on a small scale, an example of the "learning by making" pedagogical approach which is gaining considerable momentum worldwide. LBM, however, is as an approach to learning that is not only applicable to external projects taking place within the community but also to experimental projects that are undertaken internally within the confines of universities and therefore applies to the learning process as a whole.

It has long been the case that the most successful design schools, internationally, have always been those that have the best workshops and, most importantly, a pedagogical philosophy and intellectual culture that lays emphasis on the primordial importance of encouraging students to make things with their own hands, often very sophisticated physical models and prototypes.

In the last decade, with the exponential technical development and reduction in cost of 3D printers and robotics, LBM has taken on a completely new dimension, with serious implications, as several authors have pointed out, not only in terms of the future evolution of design education and practice but also on the future evolution of the social order and of contemporary society as a whole.

Schools such as the Bartlett in London or the ETH in Zürich are acquiring, for their workshops and design studios, multipurpose machines that are so sophisticated that they enable students to fabricate complex designs on an increasingly large scale, including full-scale prototypes. These machines have increasingly become, as we have noted above, essential collaborators for students, more so than their peers or their teachers or even their desktop computers, software rendering programmes, social network platforms and other addictive digital tools.

But the most important point, beyond the issue of changing modes of collaboration, is the fact that design students are now finally transgressing the age-old semantic boundaries between conception and realisation, between creation and execution, between thinker and maker. They now understand that these conventional dualities are becoming meaningless, since they are finding that many design concepts actually originate from the concrete process of making rather than from the abstract process of thinking. Even those last terms – concrete and abstract – may no longer be relevant in the light of what is now happening in cutting-edge design laboratories.

In effect, we are now questioning some of the most deeply entrenched foundation myths on which civilisation and the social contract are based.

The intimate collaboration between thinker and maker, so intimate that they can become one and the same person, a collaboration between different faculties within oneself, has revolutionary potential. It challenges all accepted notions that we have adopted, at least since the beginning of the industrial revolution, about the division of labour, between white collar and blue-collar workers, a division upon which we have always justified the distinction between ruling class and working class, between those who possess the means of production and those who don't.

This new form of self-collaboration, which has become the crux of contemporary design education, ultimately challenges, within the city, the functional divisions on which the major building typologies and modernist urban zoning concepts were based. If the thinker and the worker are potentially the same person, then it stands to reason that the home, the office, the university and the factory, and possibly even all the other archetypes that form the traditional functions and building blocks of the city, are open to question and could be hybridised in urban entities that will be fundamentally different, both physically and socially, from the city as we know it.

The above themes and their long-term implications are some of the key observations that emerged in the course of the AASA conference on "applied collaborations". They have the immense merit of being observations based on empirical case studies, whereby hypotheses were tested in the context of actual projects rather than relying on purely theoretical considerations.

The conclusions that emerged identified trends that can be considered to be early symptoms of the positive changes that are taking place within academe, at many different levels, with respect to design education. Together, they clearly lead to an understanding that the design world is in a process of mutation, with greater emphasis being put on collaborative practices, including multidisciplinary collaborations and live projects, but also on the greater impact that new generations of digital computing and manufacturing tools are now having on designers.

In summary, this publication addresses, in essence, two very different kinds of issues related to design education: on the one hand the need for both teaching staff and students to break down the distinction between learning and doing, between academe and the outside world; and on the other hand the need to be responsive to those cutting edge advances in technology that are now profoundly altering the way we think and operate.

As the papers demonstrate, these issues are complementary and together contribute to radically new forms of practice. It is encouraging to note that it was the wounded city of Christchurch, still in a process of recovery, that offered the AASA conference the opportunity to raise these radical issues through the extraordinarily inventive, playful and empowering design projects that took place within it.

London, 12th of March, 2017

CHAPTER 1 - INTRODUCTION

Interdisciplinary and collaborative design at the core of inquiry and scholarly research

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In professional practice, design operates as both a research method and a final outcome. Academic researchers in design disciplines tend, however, to privilege process.[1] The same conflict is evident in the academic arena, where students often struggle to differentiate design as process from design as the end result. Design in this sense is an iterative process with a contingent endpoint. Pretty and McPherson's essay describes the conflict that results in the classroom when the word "design" is treated as both a verb and a noun. According to their essay:

> *This morphing of the word [design] to encompass so much has led to an apparent design-washing akin to the so called green-washing / eco-sustainability washing of disciplines which has become an enormous taxonomy problem for not only the designer but also for the general populace.*

Abbot and Bowring proactively confront the dual meaning of the word "design" through engagement in interdisciplinary and collaborative live projects. Their research is conceived as "design as laboratory" or "experimental practice" – exploring the "terrains of possibility" by applying tools of questioning, collaborating, designing, grounding and communicating. In so doing, the design method and the design outcome support one another as research loop.

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[1] "As a working definition, architectural design research can be described as the processes and outcomes of inquiries and investigations in which architects use the creation of projects, built or unbuilt, or else broader contributions towards design thinking, as the central constituent in a process which also involves the more generalized research activities of thinking, writing, testing, verifying, debating, disseminating, performing, validating, etc." Murray Fraser, "Design Research in a Globalised age," in *Architectural Design Research Symposium*, ed. Jules Moloney, Simon Twose, and Jan Smitheram (Wellington: Victoria University Press), 24.

> *Design as laboratory invokes a science model, emphasising collaboration and collective research, where different research teams work on key aspects of shared questions. … The concept of the lab draws on science as a model, particularly in recognising the potency of co-operative and collective research activity.*

And academics benefit when time formally accounted for as teaching can simultaneously and strategically be recognised as research led with a range of design project outcomes addressing a shared problem or question.

Communities and academic institutions both benefit in significant ways when interdisciplinary and collaborative live projects become the prevailing mode of learning within architecture and design curricula. Abbott and Bowring refer to these benefits as engaging: "the 'knight's move' – the oblique operation where things not linearly connected are combined in unexpected ways."

Providing benefit to a community offers unique learning opportunities for students. Cerulli refers to this as a "drive towards social realism in architectural education." Students in her case studies enhanced community facilities and developed community economies by engaging in real time projects with real time budgets. Pretty and McPherson describe three years of live student projects that benefited the community by rejuvenating Christchurch after the devastating earthquakes of 2010 and 2011 within the context of the Festival of Transitional Architecture (FESTA). Marriage describes a live project that extends and applies research to showcase to the community and the students the importance of sustainability. And Abbott and Bowring describe interdisciplinary and collaborative live projects that enrich the community through environmental initiatives as well as by embedding significant cultural references.

McIntosh and Marques look closely at the cultural challenges of engaging live projects – in this case, within Māori and Pasifika communities. When cultural issues are at the forefront of a live project, collaboration is absolutely essential. For such projects to be successful, community members must be able to participate in an empowering design process that incorporates "*understanding, relationships, respect and participation.*" The student is no longer the designer, but instead becomes a facilitator for collaborative design. This role transformation also increases the leadership capacity of both the student and the community, empowering the community as a collective. And the concept of interdisciplinarity takes on new meaning; students learn that the community members themselves represent diverse "disciplines," bringing different knowledge bases into play.

By conceiving live projects that are both interdisciplinary and collaborative, research methods directly parallel contemporary architectural design practices. Pretty and McPherson present three years of case studies of large scale interdisciplinary and collaborative "live build projects" for FESTA in Christchurch. As temporary installations, they helped students understand the "*heuristic design processes that are an integral part of a prospective architect's arsenal of skills.*" Guy Marriage, in his essay, describes a live student project that represents the other end of the interdisciplinary and collaborative spectrum – one that parallels professional practice, where the end product can be rigorously tested as sustainable habitation. He describes a university-led interdisciplinary student team project that involved researching, designing, building and operating a solar-powered house for the Solar Decathlon Competition. As an international competition seeking innovative

new solutions, students came to understand how research can help disperse disciplinary boundaries and invite radically new and unexpected solutions. In the case of Pretty and McPherson's projects for FESTA, as well as Marriage's Solar Decathlon project, the opportunity to produce a project within the public realm was a significant driving force in solidifying student engagement at the highest level. Marriage's project had the added incentive of being an international competition. To win the competition required significant collaboration between team members who had to rapidly accumulate specialised knowledge from diverse fields. And this significantly enhanced the diversity of the learning experience.

All of the essays in this chapter recognise that the academic arena needs to evolve in order for interdisciplinary and collaborative live projects to flourish. Marriage notes that significant difficulties arise when an interdisciplinary live project has a wider scope than typically allowed for in the traditional academic arena. Without greater flexibility in the curriculum, such projects can face overwhelming challenges, particularly when students need to miss other courses in order to fully engage with the live project. But the realisation that live projects are interdisciplinary can provide an academic incentive for such projects to be viewed within the curriculum as reflecting the learning objectives targeted by multiple courses. With this in mind, a curriculum can be reconceived to enable interdisciplinary and collaborative live projects to take on far greater roles in design education.

Cerulli's essay reflects on the difficulties faced when a live project is assigned to students and the academic also has professional interests in the manner of a project architect or responsibility to a client, as also often occurs with guest professionals teaching in a university programme. Cerulli refers to this as the "*ambiguous and multifaceted nature of the designer educator.*" The client of a live project can have concerns about the nature of the end result, and the academic institution can have concerns about potential conflicts of interest for the academic. But both the architectural practice and the client can ultimately benefit; student design concepts provide a wider range of ideas without adding to the financial burden of the project, and they can facilitate discussion around a potential civic or community project. Students' future employability also benefits from having had actual work experience. Cerulli argues such projects should be seen as representing a "*conflux of interests*" where interests converge rather than separate. She argues that a "new vocabulary is needed to articulate the complexities of interdisciplinary and collaborative live projects at the intersection of academic research, professional practice and teaching and learning, but also to describe the confluxes of interests that might underpin them."

This is a valuable rethinking of the ethics and conduct issues associated with interdisciplinary and collaborative research, where the interests held by different participants rarely exist neatly in parallel. They diverge, converge, overlap or may exist at a distance. It is the connections, overlaps and conflux in interests that result in shared projects. The implications for project framing, definitions of responsibilities and roles, and deliverables are clear. Clarity over potentially shared ownership and use of intellectual property also emerges as an issue for research outputs, but also for professional inputs and resourcing to university programmes.

The essays in this chapter demonstrate that design research methods are diverse and deliver equally diverse outcomes. These outcomes add value to university teaching having impact on both the student learning experience and the wider host / promoters'

programme and context. Interactive and collaborative design-led research practices with their focus on both student learning outcomes and the effects of their design outcomes typically balance emphasis on process and outcomes. Both processes and outcomes have significant impact on their community contexts through the discourse generated from embedded participatory processes, exhibition and publication. The challenge for design academics is to find a direction that "*charts a course for a strengthening and more strategic role for design that is located at the core of inquiry and scholarly research,*" as noted by Abbott and Bowring. The evidence in the papers within this chapter of the book suggests this will be through increased interdisciplinary and collaborative design-led research.

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Conflux of interest.
Revealing multiple value systems in socially motivated collaborative university based projects

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Abstract
This paper discusses how collaborative and interdisciplinary socially-motivated projects and academic project-based research within the disciplines of architecture and design occupy a special territory where professional and social norms might be challenged and new types of relationships might be forged that question prevailing practices. After an initial section setting the context of the political economy of such projects, the second part of the paper reflects on the practice of these types of projects through the lens of specific projects carried out with external organisations ranging from relatively large networks of practice and research to a small, emerging community land trust. These reflections call for a new vocabulary to help articulate the value systems underpinning such projects in a way that bypasses the normative focus on competition and its corollary conflict of interest.

> " We might be more connected to one another by our worries, our matters of concern, the issues we care for, than by any other set of values, opinions, attitudes or principles."[1]
> Bruno Latour, "From Realpolitik to Dingpolitik. An Introduction to Making Things Public", 2004

Introduction

This paper reflects on collaborative, interdisciplinary pedagogical practices between universities and external partners to set the ground for a theoretical framework to understand them in relation to mutually beneficial arrangements and value created through those collaborations.

Convergence of mutual interests is at odds with some disciplinary and professional stances, which are generally more equipped and attuned to deal with conflict of interest, and which can also be seen as a corollary of the competition paradigm underpinning a large part of professional practice, from tender processes to architectural competitions. Architectural professional codes of conduct, contracts and tender documents, for instance, regularly contain prompts to declare any potential conflict of interest that might affect participants' abilities to act 'professionally', that is to say, as service providers, privileging one value system, that of the client, over the ones of other parties.

Blurring boundaries

Collaborative and interdisciplinary projects have become part of the educational offer within many higher education architecture, built environment and design-based courses[2] and reflect a drive towards social realism in architectural education.[3] There are multiple models of pedagogical projects attempting to deal with the complexity of the "real" as well as with the practicalities of the "applied" and material, many of which are labelled as "live." These vary hugely in nature and scope and can be community-based, "design and build" and "interdisciplinary" or any combination of the three.[4] Such projects usually involve a "negotiation of a brief, timescale, budget and product between an educational organisation and an external collaborator for their mutual benefit."[5] Crucially they also need to be structured to facilitate learning that is aligned with programme specifications.[6] Projects where university staff, students and third parties, external to universities, collaborate on shared endeavours, because of the powerful synergy between their often

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[1] http://www.bruno-latour.fr/node/208.

[2] Rachel Sara, "Learning from Life: Exploring the Potential of Live Projects in Higher Education," *Journal for Education in the Built Environment* 6, n. 2 (December 2011): 8–25.

[3] Tatjana Schneider, "Architecture, Education, and Cedric Price: Get a Grip, Future Architects." *The Metropolitan Laboratory* 1 (2016).

[4] Rachel Sara "Live Project Good Practice: A Guide for the Implementation of Live Projects." *CEBE Briefing Guide Series 8* (2006): 1-7.

[5] Jane Anderson and Colin Priest, "Developing an Inclusive Definition, Typological Analysis and Online Resource for Live Projects," in *Architecture Live Projects. Pedagogy into Practice*, ed. Harriet Harriss and Lynnette Widder (Abingdon: Routledge, 2014).

[6] Jane Anderson and Colin Priest, "About: Live Projects Network," accessed October 1, 2016 - http://liveprojectsnetwork.org/about.

quasi-professional nature and the critical and creative freedom still possible within university curricula, have great potential to be transformative both within and outside academia. Discussing the pedagogical model of "live project," Rachel Sara frames its privileged position of in-between the "binaries of theory and practice, university and community, designing and making, the head and the hand, and ideas about what it is to be a student, and what it is to be a professional" as transgression of boundaries.[7] The host institution of such projects, the university, becomes a mediator – sometimes facilitating, sometime resisting, a blurring of the boundaries between lay and expert knowledges[8] and designerly ways of knowing,[9] opening up possibilities to create new knowledges across divides, domains and agendas. It has been argued that an "engaged" approach to teaching can facilitate the emergence of dynamic forms of learning that go beyond subject-specific knowledge with deeper intellectual rigour, while also facilitating the development of citizenship attributes and employability skills.[10]

The active role that students take in shaping their own learning as well as the external contexts in which they operate, often induce "a heightened sense of vulnerability and uncertainty" that is at the same time "exhilarating and problematic."[11] Within the extended learning networks of participants and stakeholders created through collaborative and interdisciplinary projects, there is often a productive tension between "cohesiveness and divisiveness,"[12] which is common in learning communities.[13] This tension needs to be understood and embraced. Understanding the power relations in academic-based collaborative and interdisciplinary projects not only has bearings upon the politics of those projects and of the organisations involved, but also on the ethics of such projects. The ambiguous and multifaceted nature of the designer educator and their double design role in academic project-based research – as designer of pedagogies and designer of interventions – is key to shaping the power relations and the scope of projects. The academic/practitioner engaged in academic-based collaborative and interdisciplinary projects can be both strategist and tactician, creating and occupying spaces for engagement and participation.[14]

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[7] Rachel Sara, 'Learning from Life — Exploring the Potential of Live Projects in Higher Education'.

[8] Jacqueline McIntosh, Philippe Campays, Maibritt Pedersen Zari, and Bruno Marques, "Education as Mediation: Blurring the Line Between Expert and Lay Knowledge," in *Applied Collaborations,* ed. Daniel K. Brown, Manfredo Manfredini, Peter McPherson, Annabel Pretty, Uwe Rieger, and Mark Southcombe, AASA 2015 International Conference Procveedings, Christchurch, New Zealand: 222-29.

[9] Nigel Cross, "Designerly Ways of Knowing: Design Discipline Versus Design Science." *Design Issues* 17, n. 3 (July 2001): 49–55. doi:10.1162/074793601750357196; "Designerly Ways of Knowing," *Design Studies* 3, no. 4 (1982): 221–27.

[10] Julia Udall, David Forrest, and Katie Stewart, "Locating and Building Knowledges Outside of the Academy: Approaches to Engaged Teaching at the University of Sheffield," *Teaching in Higher Education* 20, n. 2 (February 2015): 158–70. doi:10.1080/13562517.2014.966237.

[11] McIntosh, Campays, Pedersen Zari, and Marques, "Education as Mediation."

[12] Ibid.

[13] David Jaffee,"Learning Communities Can Be Cohesive and Divisive." *Chronicle of Higher Education* 9 (July 2004); Patricia A. James, Patrick L. Bruch, and Rashné R. Jehangir, "Ideas in Practice: Building Bridges in a Multicultural Learning Community," *Journal of Developmental Education* 29, n. 3 (Spring 2006): 10–12,14–15,18.

[14] Michel de Certeau, *The Practice of Everyday Life,* trans. Steven Rendall (Berkeley; University of California Press, 1988); Yanki Lee and Jo-Anne Bichard, "'Teen-Scape': Designing Participations for the Design Excluded," in *PDC '08: Proceedings of the Tenth Anniversary Conference on Participatory Design 2008* (Indianapolis: Indiana University, 2008), 128–137, http://dl.acm.org/citation.cfm?id=1795234.1795253;

Political economies of university based collaborative and interdisciplinary projects

Projects where academic institutions work interdisciplinarily and collaboratively with external partners to achieve specific outcomes need to be understood as complex ecologies. In the context of increasingly neoliberal universities, where academic capitalism[15] is becoming the norm,[16] such projects have the potential to configure themselves as effective pockets of resistance, but they can also become instruments for validating and reinforcing the status quo, depending on how they are initiated, developed, framed and assessed.

Collaborative projects, especially those with an aim to achieve some social outcome within cities, are at odds with a neoliberal worldview, where individuals become isolated consumers at the mercy of the laws of supply and demand,[17] undermining any idea of collective action to shape the way we live. In the context of capitalism, based on precarity of workforce and fragmentations of institutions, people are usually prevented from engaging in mutually supportive social relationships.[18] Nevertheless, in reaction to this dominant worldview, a new conceptual landscape around issues of mutuality and commons is emerging, with a focus on mutual and community organisational structures and forms of ownership (including customary and common, community, co-operative and mutual, charitable), governance and economics.[19] Other views of economics,[20] including feminist approaches,[21] prepared the ground for a stream of academic work concerned with diverse economies and explicitly choosing "to bring marginalized, hidden and alternative economic activities to light in order to make them more real and more credible as objects of policy and activism."[22]

Vincenzo D'Andrea and Maurizio Teli, "Teaching Participatory Design: A Participatory Approach," in *PDC '10: Proceedings of the 11th Biennial Participatory Design Conference* (New York: ACM Press, 2010), 223-226, doi:10.1145/1900441.1900486.

[15] Sheila Slaughter and Larry L. Leslie, *Academic Capitalism: Politics, Policies, and the Entrepreneurial University* (Baltimore: Johns Hopkins University Press, 1997), http://eric.ed.gov/?id=ED409816.

[16] Oili-Helena Ylijoki, "Entangled in Academic Capitalism? A Case-Study on Changing Ideals and Practices of University Research," *Higher Education* 45, n. 3 (April 2003): 307–35, doi:10.1023/A:1022667923715.

[17] BAVO, "Introduction," in *Urban Politics Now, Re-Imagining Democracy in the Neoliberal City* ed. BAVO (Rotterdam: NAI, 2007), 7.

[18] Richard Sennett, *Together: The Rituals, Pleasures and Politics of Cooperation* (London: Penguin, 2013): 279.

[19] Cristina Cerulli, "Mutually, Commonly," in *TRANS LOCAL ACT: Cultural Practices Within and Across,* ed. Doina Petrescu, Constantin Petcou, and Nishat Awan (Paris: AAA/PEPRAV, 2010), 287–98, www.rhyzom.net.

[20] François Schneider, Giorgos Kallis, and Joan Martinez-Alier, "Crisis or Opportunity? Economic Degrowth for Social Equity and Ecological Sustainability. Introduction to This Special Issue," *Journal of Cleaner Production* 18, n. 6 (April 2010): 511–18. doi:10.1016/j.jclepro.2010.01.014; Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge: Cambridge University Press, 1990); Marilyn Waring, *If Women Counted: A New Feminist Economics* (San Francisco: Harper & Row, 1988); Ernst F.Schumacher, *Small Is Beautiful: A Study of Economics as If People Mattered* (London: Vintage, 1993); Valentin Cojanu, "Georgescu-Roegen's Entropic Model: A Methodological Appraisal," *International Journal of Social Economics* 36, n. 3 (2009): 274–86; Nicholas Georgescu-Roegen, *The Entropy Law and the Economic Process* (Cambridge, MA: Harvard University Press, 1971).

[21] Marilyn Friedman, *What Are Friends For?: Feminist Perspectives on Personal Relationships and Moral Theory* (Ithaca: Cornell University Press, 1994).

[22] J. K. Gibson-Graham, "Diverse Economies: Performative Practices for 'Other Worlds,'" *Progress in Human Geography* 32, n. 5 (2008): 613–32. doi:10.1177/0309132508090821.

It is in this context that the collaborations between universities and third sector actors, as collective endeavours within the city, can be seen as spaces of resistance and, as educators and designers, we can put forward multiple strategies to develop enabling frameworks as well as support and care systems at a range of scales and in various realms.[23] Interdisciplinary collaborations with other civic actors are the ideal locus in which such enabling frameworks can be prototyped, tested and, crucially, sustained. The privileged in-between and hybrid nature of these collaborative efforts is an ideal condition for experimentation, making them vehicles through which political positions can be enacted within university curricula. Setting up a project, designing the extent of mutual exchanges, the partnerships, the research questions, all imply political choices, but they are also all "normal," accepted, activities, core to the delivery of innovative and competitive academic programs and, for this reason, they are not scrutinised, hindered or filtered out. On the contrary, collaborative and interdisciplinary projects in which universities work with external stakeholders and actors are often promoted as flagship initiatives, since their aims and the methods appear aligned with those of the engaged civic university[24] – an attempt to reconcile market pressures and ethical stances within universities. It could be argued that, because of their affinity with the objectives of the civic engaged university, collaborative projects with external partners are, potentially, an ideal place in which to resist and contest academic capitalism from within. This would also strongly characterise these projects as a particular form of Morrow's *reconceptualisation* activism, revealing values and potentials.[25]

Furthermore, in the contemporary university context, where "human resources" are increasingly squeezed through narratives of excellence and impact, such collaborative projects are one of the few situations where time formally accounted as "teaching" can be actually also allocated to practice-based research activities. A separate challenge is how to have those research activities recognised as valid and "worthwhile." Contrary to the stance that creative research should be a tautology rather than an oxymoron,[26] design-based research is still marginalised within accepted academic research quality assessment frameworks.[27]

Critically contributing to wider programs

On-going wider collaborations between universities, civil society organisations and public bodies around specific research questions, cultural programmes or societal challenges have the potential to be an ideal environment in which to develop discrete, short term, student projects. Funding attached to those wider projects can be budgeted to allocate resources to support and enhance student projects, creating a multiplier effect so that relatively small additional resources (for travel, final outputs, dissemination, engagement activities etc.) can have impact on both the student learning experience and the wider

[23] Cristina Cerulli, "Abitare Insieme / Living Together."
[24] John Goddard, *Reinventing the Civic University - Provocation 12* (London: NESTA, 2009).
[25] Ruth Morrow, "Creative Activism: A Pedagogical and Research Tool,' *Enquiry: A Journal for Architectural Research* 4, n. 1 (April 2007), doi:10.17831/enq:arcc.v4i1.56.
[26] Paul Carter, *Material Thinking: The Theory and Practice of Creative Research* (Melbourne, Melbourne University Publishing, 2004), 7.
[27] Mick Abbott and Jacky Bowring, "A Laboratory for Design-Directed Research: Building Design Scholarship and Academic Possibility through Designing," in *Applied Collaborations*, n.d.

host/promoter research or cultural project. The timing of student projects is constrained by academic timetabling and programming, but their scope can be as wide ranging and provocative as project partners and, crucially, key academics involved feel is appropriate. Below are some reflections on a collection of six week long student projects designed as specific activities or work packages within externally funded research projects lasting between eighteen months and two years. The research and pedagogical context in which those projects were conceived and implemented, and where the author is rooted, is Agency, a now independent research network emerged within the context of the Sheffield School of Architecture (SSoA), concerned with transformative research into practice and education.[28] As an attempt to challenge the scope and broaden the framing of university-based teaching initiatives with external partners, Agency has been actively working on expanding the field of "live projects" as they are primarily conceptualised at SSoA: a well-established six week learning module, where master's students work in groups "with community clients in real time, with real budgets, on socially-engaged projects."[29] The majority of these projects, faithfully to the module programme, tend to replicate accepted norms of client-professional relationships. Members of Agency have actively attempted to challenge this singular and traditional characterisation of the potential role of architects by initiating and mentoring SSoA live projects concerned with a much wider field of architectural practice. *Agency live projects* have often been controversial and contested by colleagues, particularly because they challenged the notion of "client," undermining normative understandings of practice. However, the fact that these projects were associated with the work of wider networks, and that they were funded by the EU, has helped to argue for their legitimacy and validity. *Agency live projects* ranged from the Inconspicuous Yellow Office (IYO), a live project about live projects,[30] critically reflecting on knowledge production across SSoA live projects and generally perceived as challenging – "Nobody liked us, really"[31] – to a series of live projects in France, Northern Ireland and Turkey (associated with EU Culture 2007 project *Rhyzom: local cultural production and translocal dissemination*[32]), to a number of live projects associated with Erasmus-funded lifelong learning networks across EU countries.

One of such Agency-led live projects was associated with the EU funded Rhyzom project and mentored by the author. The client for this live project was the Istanbul-based Rhyzom partner Cultural Agencies, itself a collaborative project and a group seeking 'to develop contemporary models of cultural collaborations and institutional practices', curated by Nikolaus Hirsch, Philipp Misselwitz and the artist collaborative Oda Projesi. In the context of the Istanbul Art Biennial 2009 and of Istanbul's award of European Capital of Culture (2010) Cultural Agencies chose to work outside the "cultural bubble" of the cosmopolitan centre of Istanbul, focusing instead on the politically charged periphery of the city, in the neighbourhoods of Gülensü and Gülsüyü. Students were asked by Cultural

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[28] *Agency Research Centre* (AGENCY, June 2010).
[29] "About Live Projects," accessed November 6, 2016, http://www.liveprojects.org/about.
[30] *Live Project Live Project*, "What Is the Live Project Live Project?," last modified October 5, 2006, https://liveproject.wordpress.com/what-is-the-live-project-live-project/.
[31] Tatjana Schneider, "Discard an Axiom," in *Transdisciplinary Knowledge Production in Architecture and Urbanism: Towards Hybrid Modes of Enquiry*, ed. Isabelle Doucet and Nel Janssens (Dordrecht: Springer, 2011), 97–115.
[32] Cristina Cerulli, Florian Kossak, Doina Petrescu, and Tatjana Schneider, "Agencies of Live Projects by Agency," in Petrescu, Petcou, and Awan, *TRANS LOCAL ACT,* 287-98.

Agencies to develop an architectural concept to transform the Dukkani, a former shop turned into project base, into a prototype of a new neighbourhood institution. The initial brief and programme of work given to the students by the client were structured around the concepts of "generic institutional programs" as tools for cultural agency: Office, Archive, Communication, Events, Collection and Library. Students worked within this proposed framework suggesting new possible uses, future developments and exit strategies.[33] From quite early on in the project, however, students assumed a critical stance towards their brief, trying to articulate their unease towards some of the methods and the ethics of their "clients" and negotiating their double commitment to the client, as per professional norms, and to the citizens of the areas in which they were working. As part of the assessment of a module on professional practice students had to write group and individual reflective essays on their live project experiences; in these essays most students highlighted the tensions between different approaches and stances and carrying out their work within the required frameworks (as in professional norms), whilst remaining critical and true to their own beliefs and identified the mediations of these tensions as a key learning from the project.

Another Agency live project mentored by the author and associated with an EU-funded wider program is the Community Economies project[34]. The project dealt explicitly with diverse social and democratic ways of developing community economies within the context of an EU-funded network. Working with their clients Brave New Alps, students co-facilitated an international workshop during which network members shared practices and collectively built the physical infrastructure to turn an industrial building into a usable community facility. The aim of this project was to construct a place that facilitated the creation of 'Community Economies'. The collaborative, transdisciplinary, transnational and inclusive nature of the project meant that the students themselves – along with the forty people from across Europe who joined them in a week-long international workshop, as well as the asylum seekers living on the site of intervention – for the duration of the project were prototyping and enacting a living 'Community Economy'. In this specific instance, the student project was included in the EU Erasmus + bid and it was clearly budgeted for (all student travel and accommodation costs were covered as well as some materials and production costs) and was one of the key contributions of SSoA as a partner. However, by combining the student project with the organisation of a workshop hosted by project partner Brave New Alps and channelling students' work to support the workshop, it was possible to use the workshop to actually build physical infrastructures for a longer-term project, significantly increasing the legacy and impact of both the student project and the workshop. Individual and group reflective essays produced in the context of a complementary module on professional practice showed that students were mostly at ease with working in a context where there professional (technical) skills were both required and somewhat redundant. Students also realised how crucial it was that they were able to translate their work into the language of the funded EU project and map each of their activities on its stringed accounting framework. The concept of multiplier event, built into the EU funding requirement, also made students reflect on the

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[33] Ibid.

[34] "Community Economies," accessed November 6, 2016, https://communityeconomies.wordpress.com/.

value of creating open occasions for creating new values through the convergence of interests.

Taking a Stance and Supporting Others

Academic project-based research, including student projects, has an incredible potential to support emerging initiatives that would otherwise struggle to find sufficient resources to take off. Designing collaborative pedagogies with civic actors means supporting them by allocating resources and critical input. In the Community Economies project, for instance, the tactical convergence of two smaller and distinctly budgeted activities of a network-building programme literally helped build the infrastructure to support a much longer-term project. Channelling the efforts of teams of academic researchers and students towards supporting initiatives within the city equates to fuelling those initiatives and, for this reason, it is a political gesture.

One instance of such projects is a design studio for MA in Urban Design at SSoA developed in partnership with Sheffield CLT and Studio Polpo. This project was situated outside the SSoA flagship live project module and sought to make collaborative, "live" and practice-based the prevailing mode of learning within the architecture and urban design curriculum, the design studio. The studio set out to explore what can citizens do when the market does not provide a solution; what are the desirable, ethical and just ways of re-appropriating sways of city waiting for "investors"; and how could other ways of making the city that embody more ethical values be prototyped[35] Community-led development was one framework suggested within which to explore these issues and a focus on one particular type of community-led development, Community Land Trusts (CLTs), was proposed as a lens to reflect on citizen-led initiatives dealing with ownership and stewardship for the benefit of the community.

The project had the declared aim to support the emerging initiative of Sheffield Community Land Trust (Sheffield CLT), a project initiated by Studio Polpo, a Sheffield-based social enterprise architecture practice that the author co-founded and directs.[36] Launched a year before the design studio at the Sheffield Housing Festival, in the context of the Homes for Britain national campaign, Sheffield CLT was moving towards an "active" phase aiming to engage with local communities and stakeholders to discuss models, scenarios and potential routes to establish a CLT in Sheffield. The urban design studio was set up to work with Studio Polpo and Sheffield CLT to explore and propose avenues for community-led development in Sheffield City Centre within the wider framework of the Sheffield CLT project.

As one of the two leaders of the design studio and one of the initiators of both the Sheffield CLT project and the not-for-profit architecture practice Studio Polpo, I[37] reflected intensely on my role and my position in this project. Was what I was attempting appropriate? Were there any potential conflicts of interest? In some academic contexts alignment and overlapping between studio projects and tutors' "private" practice is seen

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[35] Cristina Cerulli and Beatrice De Carli, "Project 3 - Re-Appropriating the Post-Industrial Landscape through Community Led Development Introduction Theme," April 2016.

[36] "Studio Polpo," accessed November 6, 2016, http://www.studiopolpo.com/.

[37] What follows is a series of reflections, in first person, by the author on aspects of her pedagogical practice in relation to conflux of interest.

as a desirable means to introduce practice "real world" imperatives into architectural education. In the context of SSoA this was seen as a potential problem as well as an important opportunity.

A few years earlier I was prompted to reflect on the commodification of live projects and how they can easily become a trading currency. I had been actively involved in Portland Works, a community-led project that took collective ownership of an industrial heritage asset under threat to run it cooperatively for the benefit of the community.[38] I had mentored a very successful live project with Portland Works[39] and, when in conversation with the "client"/partner organisation I co-initiated a second live project two years later, I was unable to mentor the project because I was perceived as "too close to the project." I have spent considerable time since reflecting on what "being too close" might have meant. Was the decision not to allow me to mentor the project motivated by a desire to limit the perceived or implied personal or professional gains that might have resulted from the project? Or was it to allow others to share the limelight associated with this pioneering project that had attracted considerable media attention and was unanimously considered an exemplar? Or was it simply an honest attempt at mitigating potential conflicts of interest? I also reflected on the synergies and interdependencies between my teaching, academic research, practice-based research, and my practice and came to articulate my position in terms of conflux of interests,[40] where a virtuous, complex mutually beneficial relationship existed for all parties involved and between all the hats that I might be wearing at once.

In the example of the Sheffield CLT urban design live studio, a project that I initiated with others outside the university, as practitioner, benefited from the work of a student project that I designed, as academic. Indirectly, also my practice Studio Polpo benefited from the work of my students because, even as a social enterprise committed to initiating paradigm shifting projects, Studio Polpo would have never been able to allocate comparable resources towards a non-fee-earning project like Sheffield CLT.

Conversely, however, based on reflective portfolios part of the studio assessment, my students found very positive the live aspect of their design studio and valued the fact that their work contributed directly to Sheffield CLT. Some students also pointed out that in a context in which for international students it is increasingly difficult to get work experience within the UK, working with a UK-based practice from within the curriculum also improved their employability.

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[38] Cristina Cerulli and Julia Udall, *Alternative Futures for Portland Works* (Sheffield: Antenna Press, 2011); Cristina Cerulli and Julia Udall, *Re-Imagining Portland Works* (Sheffield: Antenna Press, 2011); Cristina Cerulli, "Transformative Knowledge Production: The Case of Re-Imagining Portland Works KT Project," ; Cristina Cerulli, "Thresholds of Engagement and Nuanced Approaches in Civic Crowdfunding: Lessons from Portland Works, Sheffield."

[39] "Portland Works Live Project," accessed November 6, 2016, http://www.liveprojects.org/2011/portland-works/. Live Projects Network, "Decision-Making Tools," accessed November 6, 2016, http://liveprojectsnetwork.org/project /decision-making-tools-for-portland-works/.

[40] Cristina Cerulli, "Leverage, Alignment and Currencies / Ethics and Methods for Cultural and Educational Institutions Engaging with Processes of Urban Transformation in Contested Areas" (keynote lecture presented at AESOP: Becoming Local: Public Space as an Imaginary of Alternative Urban Futures, Özyeğin University, Istanbul, November 20, 2013).

Conclusion

Beyond the general aims of the various models of academic project-based research, the specificities of each of these projects with their complex interdependence of aspirations and motives are often determined by a conflux of interests of at least some of the parties involved. This convergence, conflux, of multiple interests, however, is at odds with cultures of professionalism, both in practice and academia and, perhaps, with some legal frameworks associated to them.

Through reflecting on three socially motivated collaborative pedagogical projects and on the ethical issues and value systems associated with them this paper attempted to bring to the foreground an understudied aspect of such projects: the degree of alignment between value systems, motives and objectives and the potential value of the convergence of multiple agendas. The conflux of multiple interests could emerge as a necessary condition for developing successful socially motivated projects; and university-based initiatives can catalyse, fuel, question and help sustain such projects. Converging interests have the potential to create virtuous conditions, amplifying the signal[41] of small but significant initiatives, and yet there is no expectation to articulate any conflux of interest, to declare or reveal the interdependencies and multiple benefits accrued by various parties involved in socially-motivated projects. Tactical and opportunistic approaches are often needed to assemble socially-motivated collaborative projects, particularly with regards to creating synergies within a context of resource scarcity.

What if the value of projects was also understood in terms of the number of mutually beneficial relationships that they foster? A new vocabulary is needed to articulate the complexities of interdisciplinary and collaborative projects at the intersection of academic research, professional practice and teaching and learning, to describe the convergence of interests that might underpin and sustain them. Such vocabulary would assist with articulating the value systems underpinning these projects, framing them in a positive way and bypassing the normative focus on competition and its de facto corollary of conflict of interest. This, in turn, will have the potential to create shifts in how the value of professional work is conceptualised.

Similarly to scholarly activist research,[42] whose rigour needs to be defined in different terms, socially motivated academic project-based research needs to be understood in its own terms and the conflux of multiple interests is one of its key characteristics.

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[41] Ezio Manzini, 'Enabling Platforms for Creative Communities'.

[42] Diane C. Calleston, Catherine Jordan, and Sarena D. Seifer, "Community-Engaged Scholarship: Is Faculty Work in Communities a True Academic Enterprise?" *Academic Medicine* 80, n. 4 (2005): 317-21, accessed July 19, 2013. http://journals.lww.com/academicmedicine/Fulltext/2005/04000/Community__Engaged _Scholarship__Is_Faculty__Work_in.2.aspx.

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Designing for culturally-diverse communities. The role of collaborative, interdisciplinary design-led research

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Abstract

Successful design for culturally-diverse communities hinges on a nuanced understanding of the cultural environment; building trusting relationships and fostering a respectful approach to community. This paper discusses the application of design-led research with a participatory mind-set and maintains that while a collaborative, interdisciplinary participatory design process is essential, a design-led research approach is particularly valuable. Blurring the boundaries between disciplines brings the users to the forefront of design as active co-creators, sharing ideas, tools and methods. It examines two projects – a Tokelau / Pasifika cultural museum exhibition involving museum curators, architects, interior designers, photographers and local community members; and a Māori landscape regeneration project in the Wairarapa region of Wellington – wherein the designers (in this case the students) took the role of facilitator rather than providing a hierarchical and potentially adversarial approach to community design decision-making. The research project was framed around three critical stages: design analysis (holistic context), design exploration and testing (exploring design scenarios), and design synthesis (agreed plan or direction). It finds that participatory design when performed correctly can increase the capacity for community engagement; provide substantial benefits to the design outcomes; and beneficially exploit the process of design-led research. In addition to the community benefits, this interdisciplinary and collaborative research process can create new opportunities for architectural design education as it educates students as world citizens. As such it has the potential to transform architectural practice.

Keywords: participatory design, design-led research, interdisciplinary research, collaborative research, Māori Pasifika.

Introduction

The nature and characteristics of design-led research in academia are in a state of flux. The research model where the prevailing culture is 'experts' designing for people, that has typically led practice, has had a long and extensive history in academia. However, more recently a design-led perspective has come into focus with a common goal of driving, inspiring and informing the design process[1]. In both academia and practice, this perspective shares a history of 'expert' designers creating for people and in both approaches, the end users are seen as reactive informers[2]. This paper explores an alternative view where the users are seen as partners, or active co-creators in the design process. To date, there has been broad diversity in practices and behaviours in this regard. Some researchers/designers essentially engage in symbolic activities or 'window dressing' to create an impression of commitment to community development, while others display a genuine commitment by expending substantial resources that go well beyond any legal obligations[3]. This paper considers both perspectives as it discusses the application of design-led research through a collaborative and interdisciplinary participatory design-led process, which in turn forms an essential interface between teaching and practice. More specifically, it discusses a series of interdisciplinary activities that were the result of collaboration between various community groups and the School of Architecture at Victoria University of Wellington, where participatory design methods were employed in the design and development of community facilities and environments. Two interdisciplinary and collaborative student projects were considered within this paper: a Tokelau / Pasifika cultural museum exhibition at the Pataka Art + Museum in Porirua, and a Māori landscape regeneration project in the Wairarapa exhibited in a local community hall in Featherston.

- *Tokelau: Then Now, Now Then* involved 15 interdisciplinary Victoria University of Wellington students (architecture, interior architecture and landscape architecture) working collaboratively and closely with museum curators, interior designers, photographers, anthropologists, architects and local members of the Tokelau community based in Porirua, New Zealand to design a "cultural museum" representing Tokelau customs, interactions and design-based rituals.
- *Akoranga: Wairarapa Moana* involved 20 Victoria University of Wellington students of landscape architecture working collaboratively with the Greater Wellington Regional Council, South Wairarapa District Council and members of the local Māori iwi Ngāti Kahungunu ki Wairarapa based in the Wairarapa, New Zealand to design sustainable and culturally sensitive solutions to the flooding of the Ruamahanga and Tauherenikau Rivers and Lake Wairarapa.

Both groups of students attended a number of workshops where they consulted with prominent members of the local Pasifika and Māori communities respectively. The two final exhibitions allowed critical reflection on the results in the context of community engagement.

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[1] Kirsikka Vaajakallio and T. Mattelmaki. "Collaborative Design Exploration: Envisioning Future Practices with Make Tools" Proceedings of the 2007 Conference on Designing Pleasurable Products and Interfaces, 223-238, New York ACM Press, 2007.

[2] Liz Sanders, "Design Research in 2006". *Design Research.* Quarterly 1, n. 1 (2006) Design Research Society.

[3] Ciaran O'Faircheallaigh, "Aborigines, Mining Companies and the State in Contemporary Australia: A New Political Economy or 'business as Usual'?" *Australian Journal of Political Science* 41, n. 1 (2006): 1-22. p. 6.

The motivation for a participatory process came from the lack of traditional research from which to base design for Māori and Pasifika communities. To understand the complexly structured world of diverse societies, the researcher must understand that people are far different in nature from data and processes. People have different and conflicting objectives, perceptions, and attitudes; and they often change over time. Good design solutions are rarely clear, and winning the agreement of all interested parties is quite difficult. An iterative process involving design researchers with users and students acting together on a particular series of activities, including problem diagnosis, action intervention, and reflective learning, allows the researcher to gain feedback from the experience, modify the design as a result of the feedback and try it again. Each iteration of the process adds to the framework and informs the eventual design.

Users as active co-creators: developing collaborative relationships
The process for ensuring community members were able to participate in a rich and empowering design process has been summarised under the following four sub-headings:
1) Understanding - of place
2) Relationships - building upon trust
3) Respect - sensitive facilitation
4) Participation - sharing of knowledge

Understanding: A participatory design process always commences prior to first contact. With both communities, design practitioners had to develop a holistic understanding of the project environment (social, ecological, economic and political), and the history of events and beliefs that shaped the current situation. In addition, they required knowledge of the degree to which there was capacity within the community. For the Tokelau community, this involved a broad multi-disciplinary review of the literature, including ethnographic, ecological, medical, economic, sociological, anthropological and political literature. A detailed inventory of all community members, their interests, their affiliations and the areas in which they wished to contribute as then collected. For the Wairarapa project, students worked with the local iwi to understand their cultural protocols, tribal affiliations and their relationship to the wider environment and community.

Relationships: During the relationship-building phase, the creation of trust was imperative for opening the channels of communication between members of the engagement team and the residents, other stakeholders, and project participants. For the Tokelau community, this involved formal introductions through the former mayor and city councillors following with many hours of meetings, social gatherings and events which facilitated discussion. The relationship developed over a three year period and eventually involved numerous student projects. For the Wairarapa project, the process was initiated by an invitation from community elders for a get-together, wherein the community defined its own design priorities by identifying projects with strong spiritual or cultural meaning. This relationship also developed over a three year period and involved many hours of active listening, social interaction and discussion. To be sustainable long-term, students and designers must undertake relationship-building activities over numerous years within the communities, engaging with a personal style of interaction to gain

appropriate levels of trust and respect. From these experiences, we have come to realise the importance of meeting people on their own terms, developing informal meeting opportunities and building relationships by listening 'one-on-one'.

Respect: The notion of storytelling is an integral part of Māori and Pasifika cultures and had to be acknowledged for both the Tokelau and Wairarapa relationships to be successful. The sharing of food was also an important and on-going activity for establishing cultural respect.

Participation: Techniques for optimal participation involved working with established community and stakeholder groups, rather than imposing purpose-built committees. It quickly became evident in all projects undertaken to date that active people within smaller communities were already stretched, often overworked and were also involved in the delivery of many other menial community tasks. Finding ways to support local champions can often be the beginnings of allowing space for the community to develop or grow in new directions.

Figure 1: Akoranga: Wairarapa Moana project: Students meeting with local community members.

Introducing students to the local Tokelau and Māori communities facilitated an exchange of cultural information, which enabled the communities to design with-and-through the students. The connection allowed students to work in Māori and Pasifika traditional models of engagement which respect to life experience over abstract theory. While this type of connection is only superficial at best in a highly complex cultural context, it can assist students going forward as future professionals, through an awareness of the existence of these often-hidden values. From the university's perspective the relationship provided the means to train its students as future professionals of the built environment by working with real clients, while also preparing them to be socially responsible world citizens.

Educationally, these interdisciplinary and collaborative approaches are grounded in critical pedagogy,[4][5] social learning theories,[6][7]and constructive developmental theories.[8][9]

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[4] Ruth Morrow, "Creative Activism: A Pedagogical and Research Tool," *Enquiry: The ARCC Journal of Architectural Research* 4, no. 1 (2007): 60-68; Harriet Harriss and Lynnette Widder, eds., *Architecture Live Projects: Pedagogy Into Practice* (New York: Routledge, 2014).

A series of interdisciplinary collaborations

The two participatory design projects described, both included a full range of activities such as: extensive site visits varying in length from an afternoon to a full week; meetings and workshops; youth development projects; community funded University Summer Scholarships; and public exhibitions of the work undertaken.

Both exhibitions proved to be of particular success as they provided early opportunities for the groups to work together for a shared goal. The Tokelau public museum exhibition in Porirua and the Wairarapa community-based exhibition, held in a local community building, were well attended. What was unique for the Pataka Art + Museum was the high numbers of young attendees, many of whom were first time visitors. Other visitors to the "Tokelau: Then Now, Now Then" exhibition, which showed at the Pataka Art + Museum as part of the Wellington Arts Festival from 21 February to 13 April, 2014, included Pasifika and Māori elders, church leaders, government officials, politicians and diplomats, as well as university leaders and students. The two exhibitions helped to strengthen the sense of community, preserve and showcase aspects of the culture and foster a collective shared vision for the future. Empowerment resulted from this grassroots participation, mutual decision-making and shared implementation and was evidenced by a wide range of 'spin-off' activities, such as educational and family well-being initiatives. Figure 2 illustrates the relationship between the Pasifika Community, Victoria University of Wellington and Pataka Art + Museum.

We found that an interdisciplinary approach to design was important because it potentially led to greater sustainability outcomes but also it provided social benefits due to a more involved and socially inclusive design methodology[10]. Much architectural education emphasises individual and competitive learning [11] and it was therefore important that students had the chance to work with other disciplines such as interior architecture, museum studies, ecology, photography, and art curation on the complex problems that presented in group situations[12]. Building on prior student work enabled consistency, continuity of relationships and passing-on of knowledge and insights that are often difficult to achieve in long-term projects.

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[5] Harriet Harriss and Lynnette Widder. *Architecture Live Projects: Pedagogy into Practice / Edited by Harriet Harriss and Lynnette Widder.* First ed. 2014.

[6] Donald A. Schon, *The Reflective Practitioner: How Professionals Think in Action* (New York: Basic Books, 1983); Edwina L. Stoll, "An Introduction to Collaborative Learning: From Theory to Application," *Communication Education* 45, n. 3 (1996): 260.

[7] Edwina L Stoll. "Collaborative Learning: Higher Education, Interdependence, and the Authority of Knowledge". *Communication Education* 45, n. 3 (1996): 260.

[8] Gregory S. Blimling, "Creating Contexts for Learning and Self-Authorship: Constructive Developmental Pedagogy (review)," *The Journal of Higher Education* 73, no. 2 (2002): 307; Robert Kegan, *In Over Our Heads: The Mental Demands of Modern Life* (Cambridge, MA: Harvard University Press, 1994).

[9] Robert Kegan. *In over our heads: the mental demands of modern life / Robert Kegan.* (Cambridge, Mass: Harvard University Press, 1994)

[10] Daniel Christian Wahl and Seaton Baxter, "The Designer's Role in Facilitating Sustainable Solutions," *Design Issues* 24, n. 2 (2008): 72.

[11] Anthony D. Cortese, "The Critical Role of Higher Education in Creating a Sustainable Future," *Planning for Higher Education* 31, n. 3 (2003): 15.

[12] Maibritt Pedersen Zari, "Changes in Climate Driving Changes in Architectural Education," *Enquiry: The ARCC Journal of Architectural Research* 6, n. 1 (2009).

Figure 2: Diagram illustrating the relationship between the Tokelau Community, Victoria University of Wellington and Pataka Art + Museum.

Participatory design

Design-led philosophies and methods hinge on understanding that the health of a community has a symbiotic relationship with how empowered participants are engaged with their environment and can have a say in changing their existing condition into their preferred one. In our experience of participatory design methods, the roles of the designer and the researcher blur, and community becomes a critical component in the process[13]. People involved want to express themselves and participate directly and proactively in the design development[14]. Both communities were excited to be involved in brainstorming, decision making and conceptual design of potential future scenarios. Participation in decisions that determine the quality and direction of built environments gives primacy to the community's rights to participate in the shaping of the world in which they live[15]. There is an ethical stand underlying participatory design that recognises an accountability of design to the world it creates and the lives of those who inhabit it. Participation hereby enhances the meeting of social needs while increasing the effective utilisation of resources at the disposal of a particular community[16]. For the two communities, it represented an increased sense of having influenced the decision-making process, and provided a greater awareness of the reasons for, and consequences of, the

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[13] Elizabeth Sanders, "From User Centred to Participatory Design Approaches," in *Design and Social Sciences: Making Connections,* ed. Jorge Frascara (New York: Taylor & Francis, 2002), 3.

[14] Elizabeth Sanders, "On Modeling: An Evolving Map of Design Practice and Design Research," *Interactions* 15, n. 6 (2008): 13.

[15] Henry Sanoff, *Participatory Design: Theory & Techniques* (Raleigh, NC: Henry Sanoff distributor, 1990).

[16] City University of New York. Environmental Psychology Program. Working Group on Participation, and Lisa Cashdan, *A Critical Framework for Participatory Approaches to Environmental Change* (Center for Human Environments, 1978).

decisions made. It also guaranteed more relevant and up-to-date information than previously available. Research has shown that the main source of user satisfaction is not so much the degree to which the individuals' needs are met, but the feeling that they have influenced the decision[17]. At different times in the process, both communities discussed the cultural shift from how it was no longer about hierarchies but about networks which led to stronger and more influential fronts. The collective became willing to express what they wanted, when they wanted it and how they wanted it. The challenge for the students was to explore an experiential design for the task at hand, one whose aim was to design the users' experiences of things, events and places. Creating this methodological framework enabled the effective use of rational design methods without affecting the creative processes[18].

From on-going experiences grounded within both academic and professional practice, the authors acknowledge three critical stages where willing participants can contribute to the design process. These three critical stages are what we refer to as the base or the ABCs of design:

  A) Design Analysis (holistic context);
  B) Design Exploration and Testing (exploring design scenarios); and
  C) Design Synthesis (agreed plan or direction).

The role of the university in community based design-led research
Prevailing discourse emphasises the university's place as a paramount player in a global system increasingly driven by knowledge, information, and ideas [19]. Knowledge has become a main driver of economic growth, and education is increasingly the foundation for individual prosperity and social mobility[20]. By focusing on the social, cultural, and cognitive bridges offered in specific courses of study, these types of community projects highlight the strengths of a multicultural, multidisciplinary, collaborative learning approach. A bridge must be anchored on both sides, with as much respect for where it begins as for where it ends[21]. Student activities have the ability to mediate between diverse worlds in the process of learning and exploring. On one side of the bridge lies the students' familiar home territory, including their family, work place, peers, and institutions[22]. On the other side is the territory of cultural communities, which are shaped by rules, traditions, discourse and values that may be very different from students' own understanding.

The University can help students construct bonds between their own personal and cultural knowledge and that of another community and create pathways for them to learn

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[17] Sanoff, *Participatory Design.*

[18] Stefan K. Wrona, *Participation in Architectural Design and Urban Planning* (Poland: Warsaw Technical University, 1981).

[19] Stewart Clegg, Walter P. Jarvis and Tyrone S. Pitsis, "Making Strategy Matter: Social Theory, Knowledge Interests and Business Education," *Business History*, 55, n. 7 (2013).

[20] Robert Lawy and Gert Biesta, "Citizenship as Practice: The Educational Implications of an Inclusive and Relational Understanding of Citizenship," *British Journal of Educational Studies* 54 (2006): 34.

[21] Kegan, *In Over Our Heads.*

[22] Richard Beach, Dana Britt Lundell, and Hyang-Jin Jung, "Developmental College Students' Negotiation of Social Practices Between Peer, Family, Workplace, and University Worlds," in *Exploring Urban Literacy & Developmental Education,* ed. Dana Britt Lundell and Jeanne L. Higbee (Minneapolis: Center for Research on Developmental Education and Urban Literacy, University of Minnesota, 2002), 79.

from the communities' experiences and ways of knowing and being. For example, in the Tokelau project, students from different courses, different years of study and different design disciplines formed a learning community in which members helped each other learn to research a wide range of topics, from sustainable energy solutions, through low-cost furniture construction to community centre planning and design. By building upon prior student work and through supporting each other by listening, problem-solving, and working together, students honed academic skills and explored ideas in ways that valued individual knowledge. In the case of the Wairarapa regeneration project, students studied local ecologies, traditional practices and cultural ways of knowing. In both cases, students were invited to use academic skills to explore what it means to practice community: by working together as a group with a shared mission in order to better understand the nature of design-led research.

Facilitation and coordination practices continued beyond the design itself into actual implementation of the projects. Tokelauan youth built stylish no-cost furniture from found materials working from student designs, then advanced this strategy into the construction of an outdoor cooking and eating area as well as implementing a new form of community centre planning. The Wairarapa community used the regeneration project to inform their youth of traditional indigenous practices. This assisted both communities in finalising their development plans and led to a sustainable result that engendered a strong sense of ownership. The process also built upon skills that the community already had, such as detailed construction and cultural techniques which reinforced their own design languages and cultural understandings.

Figure 3: Akoranga Wairarapa Moana project: students outside Hurunui-o-Rangi marae in the Wairarapa.

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Conclusion

This paper explores the motivation for design-led research with a collaborative, interdisciplinary and participatory mind-set. Research involving Māori and Pasifika cultures can benefit from alternative design strategies that are not entirely based on an abstract set of universal design principles but extend and expand from these principles in a way derived from their own specific cultural contexts. The process "…is more than a technical process; it requires the active participation of community members. Through their participation, they validate their culture, keeping it alive and evolving"[23].

Experiences has found that many community development 'experts', be they practicing in policy, planning, design or all mentioned, still undertake a conventional design approach which may include: a shallow analysis, a possible survey of client requirements and expectations and a 'for information only' level of public consultation – often only informing certain members of the public about the already-agreed-on design direction. These preliminary actions are then followed by desktop design preparation. A plan and/or report is produced to be either shelved or used at the local authority's discretion. Ultimately, in this way, the design process can be played out literally behind closed doors. End users may awaken one day to be greeted by the latest new amenity or development to be imposed on their community.

In the production of an exhibition with hybrid 'collectives' of academics, laypersons, community members, artefacts and activities, there is the creation of a new network and a reconfiguration of the boundaries between research knowledge and new forms of design practice. Design institutions can mediate between cultures and foster social change through the education of their students as world citizens and applied researchers.

There are many benefits to this design-led approach, as evidenced by the outcomes from the Pataka, Art + Museum exhibition, including improving civic participation and ensuring more democratic results. Similarly as demonstrated by the Māori community engagement, this approach can create a strong sense of community, strengthening people's attachment to their place and to each other, as well as producing more sustainable solutions. Conceptualising student learning as a dynamic process of interaction between communities, histories, and contexts, replaces the view that equates agency with individual self-sufficiency. Themes of identity, community, and agency arose from the work and instead of being isolated by difference, students were proposing that

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[23] Michael Hibbard. & Adkins, Robert. 'Culture and Economy: The Cruel Choice Revisited', in Ryan Walker, David Natcher, and Ted Jolola, (eds.), *Reclaiming Indigenous Planning*, (Montreal: McGill-Queen's University Press, 2013), 72.

communities embrace interdependence. Agency is viewed as a matter of participation, collaboration, and a shared sense of mission.

The diverse activities discussed in this paper gave students multiple opportunities to articulate their own understandings of culture in the framework of developing sensitive, sustainable design-led solutions. By constructing their own ways to integrate personal and cultural knowledge with the course content, students acted as creators of knowledge and partners with instructors rather than as passive consumers. There was often a heightened sense of vulnerability and uncertainty that was both exhilarating and problematic. However, for most students the community provided an anchor and a kind of accountability they might not have experienced if they were in a course without community connection. In this manner, interdisciplinary and design-led research can provide an essential interface between teaching and practice.

Solar Decathlon.
Interdisciplinary and collaborative
research competing on a world stage

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Abstract

The Solar Decathlon is an international student competition requiring university-led interdisciplinary student teams to research, design, build and operate a solar-powered house. Projects like this are highly competitive but have significant learning benefits for those involved. The Decathlon requires a wide range of student skills and so is by nature highly interdisciplinary. To win requires a significant amount of collaboration between team members who must rapidly accumulate specialised knowledge of diverse fields including solar design. This paper looks at the Solar Decathlon 2011 project submitted by Victoria University of Wellington, New Zealand, examines the pedagogical methodologies used, and debates the usefulness of this type of interdisciplinary and collaborative project for students of a school of architecture. It notes the difficulties placed on integration of a single-project focus on the wider scope of a typical architectural education and proposes that the broader degree curriculum may benefit from evolving to better accommodate the flexibility needed for targeted design-led research competitions such as the Solar Decathlon.

Keywords: solar powered, modular house, student project, collaborative design.

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Introduction
The Solar Decathlon is the biggest architectural student competition in the world. The aim is for student-based teams to design-build a small house and run it solely using solar power for the course of the competition. Started in 2003 by the United States Department of Energy (DoE) and run bi-annually since then, the Solar Decathlon pits student teams against each other in a series of competitions. The word Decathlon in the title is used deliberately – there are 10 competitions (five judged by experts, five scored on points by independent judges) held over 10 days with winning podium places equivalent of bronze, silver and gold medals. As a form of design-led research and an implementation of theory into collaborative practice, this is the ultimate challenge for students. The program has effectively become embedded in many USA schools of architecture, with success at the Solar Decathlon seen as the pinnacle of achievement. A key issue for competing schools of architecture, however, is that the current pedagogical systems in place at most universities is via a series of individual courses, undertaken by students one term at a time and not readily adaptable to one large project such as the Decathlon.

Changing the curriculum in order to fit the very different requirements of the Solar Decathlon is therefore part of the challenge, where a large group of students are required to work continuously and highly collaboratively, rather than compete for marks individually. As a project, the Solar Decathlon is very different to the normal design exercises held in architecture schools, where designs are typically conceived on paper and remain in two-dimensional form. Actual, physical, real-life buildings are exceptionally rare as an output of an academic experience. A more typical academic experience would be for a student to have to take a number of small, specialised papers on aspects such as professional practice, methods of construction, ventilation and heating, sustainability, and of course design. In many modern schools the student could graduate without having ever had to use a hammer, or in some cases, to even see one. To succeed at the Solar Decathlon requires different means of teaching. This chapter uses the example of the 'Team New Zealand' entry in 2011 to illustrate the issues.

Competition aims
The aims of the competition are focused on raising public awareness about alternative energy sources, and up-skilling the architectural student population. The teams comprise primarily architecture students and services engineering students, but are open to all and thus provide an excellent opportunity for student collaborative and interdisciplinary relationships to become established and expanded.

The competition requires each team to design and build a house, assemble it within a week, and run the whole house for ten days solely off solar power generated on site. It requires extensive interdisciplinary collaboration between different streams of students and, as a form of design-led practice, it is an excellent learning tool. Asking a group of semi-skilled architectural students to design and build a house to the following brief is a lofty aim:
  • Build a modular house and transport it several hundred (or thousand) of kilometres across the country;
  • Assemble or reassemble the house in just five days on a blank site with no permanent power or sewerage;

• Run the house entirely off solar power for a period of ten days, while also performing standard "living" tests (washing, cooking, entertaining, etc.), and then escorting 10,000 or more visitors through the house over a three day period, while maintaining the highest health and safety conditions;
• Disassemble the house entirely in four days and remove it, leaving no trace except for some bent blades of grass.

It is a big event on the student horizon – every mobile crane company for many miles around is fully booked by Solar Decathlon participants for the assembly / disassembly phases, with typically 20-30 mobile cranes present on site for the initial night of installation. Each year millions of dollars are spent corralling efforts around this program, and each year some teams fail to complete some of the tasks or even drop out of the competition completely. To add to the difficulty, all the work on site must be undertaken by enrolled students – no mean feat when most of the students on the teams are only 2-3 years out from high school. At Victoria University, the students were drawn from the schools of Architecture, Design, and Marketing, with further input from the programs of Building Science, Interior Architecture, Digital Media, Landscape Architecture, Industrial Design and Tourism. Faculty advisors are limited to certain roles off-site such as administration, while professional tradespeople are limited to restricted work such as electrical wiring, as the aim of the competition is for the next generation of architecture and engineering students to learn about the practical side of house construction. In turn, these young students will become the new leaders in the emerging solar-based economy. While those aims are admirable, there are issues with how these aspirations can fit with and co-exist within a 'usual' university degree structure.

Teaching architecture

Teaching architecture via a degree at a university is a relatively new means of learning. Traditionally, budding young student architects were articled to older, more experienced architects, often paying for the privilege: similarly, young builders were apprenticed to older builders. Architects faithfully copied classical details to adorn their buildings, as did their builders. The establishment in London of the Architecture Association in 1890 started the split away from practice towards academia and offered a reaction against the perceived poor ethics of articled students, while encouraging the relative freedom of academic thought. The establishment of the Bauhaus in 1919 in Weimar introduced modernism to the architectural world, coinciding with the decline of architecture designed in a Beaux-Arts style. The decline of the Beaux-Arts training methods of studying and reproducing classical motifs occurred around the same time and were mirrored by the rise of the more modern system of creative architectural studios, pioneered by the art studios of the Bauhaus, led by Walter Gropius (Director from 1919 to 1928) and later Mies van der Rohe (Director from 1930 to 1933). The Bauhaus methods of teaching emphasised the artistic merits of designs as well as the craftsmanship of their construction and introduced the design studio as the prime method of teaching architecture for the modern age. This teaching style spread rapidly across Europe and later worldwide.

Balancing academic and non-academic skill sets
The modern architecture student is not trained as a builder, and is therefore typically lacking in hands-on knowledge of the practical skills of building. There is in New Zealand little or no working interface between building apprentices and university architecture students; in effect, the two groups learn different subjects, and speak different languages. It is important that the students learn that the two sides need each other and need to learn to work together. For this reason, students in the Solar Decathlon and other programs (such as Rural Studio in Alabama or Studio 19 at Unitec in Auckland) are eager to integrate their academic learning with the acquisition of practical skillsets. This hands-on learning is in strong contrast to that of a typical modern school of architecture, where increasing class sizes and increasingly onerous Health and Safety regulations are having a deleterious effect on practical aspects such as site visits and workshop work.

First Light team
The brief from Professor Patrick Walsh, the Pro-Vice-Chancellor (PVC) at Victoria, was simple: "go there, and win".[1] That dictum drove the team onwards – but the university-sponsored Project Managers instead promoted the concept that keeping to a nominal budget was of the uppermost importance. The PVC had notably not said –"go there and win on a limited budget". To fully cover the scope of what happened in the competition is beyond this paper and has been covered extensively in other publications. Instead, this paper is focused on the pedagogical aspects of incorporating a project such as this into the standard learning objectives and teaching methods of a school of architecture.
For Victoria University students, the 2009 Solar Decathlon was used as the framework for an interdisciplinary studio design elective course. The assignment brief was to take the aims of the Solar Decathlon and to design a house that would meet the brief – a strictly paper-based assignment of a few weeks duration. Groups of four students were put together randomly, and each team produced a house design that met the brief. The strongest design, First Light, by Anna Farrow, Benjamin Jagersma, Eli Nuttall and Nicholas Officer, was entered into Solar Decathlon 2011 with the tentative support of the University, who perhaps did not realise the size and scale of the project ahead. Students signed up from Architecture, Building Science, Digital Media, Industrial Design, Marketing, Tourism, Landscape Architecture, and Interior Architecture – and only the most passionate, capable and hard-working of those went forward into the final selected team.
The First Light team entry was selected by the competition organisers as one of twenty that would compete on this international stage in 2011 against the other best university entries from around the world. The nineteen other student teams selected included one from China, one from Canada, and one from Belgium, with all other challengers coming from the United States – primarily from nearby East Coast states, but also including an entry from California and one from Hawaii. All student teams were interdisciplinary, and some universities even collaborated with others – for instance, SCI-ARC (a University entrant) was partners with Cal-Tech (a Technical Institute). The New Zealand entry was the first ever entry to be accepted from the Southern Hemisphere and therefore the furthest away

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[1] Pat Walsh – speech to the student team (Wellington, Victoria University, May 2011).

entrant ever. To compete on this world stage would prove to be a considerable challenge, requiring significant collaboration amongst the students and faculties involved.

The student team had to not only design and build the project, they had to go out and sell the scheme to raise the money as well. Marketing and tourism student experience on the team was hugely useful, as an extensive media presence had to be created, but in the end, the four original architecture students still undertook the vast bulk of the public relations work as well as leading the design and documentation of the project. Jagersma became the specialist in building services systems, while Officer concentrated on the promotion and management of the project. Nuttall took control over the construction of the actual house, while Farrow masterminded both the interior fit-out and the external landscape. None of these roles were their original focus within the School of Architecture, but by collaboratively working together as a tightly focused team, the project was a great success. The collaborative method of learning, with all students working towards a common goal (instead of competing against each other for better grades) seemed to result in a much stronger outcome for the student cohort. The team succeeded in getting sponsorship for almost the entire project, both for individual elements (e.g., doors and windows sponsored by Eco-Windows) and the overall scheme (the project becoming officially known as the Meridian First Light House).

In the end, the project competed at an extremely high level, with the First Light House winning First Prize in Engineering, Energy Balance, and Hot Water generation; a tantalizingly close Second Prize in Architecture, and Third Prize in Market Appeal; as well as Third Prize overall. The first for Engineering was particularly pleasing for the team as no engineering students were involved in the project. Specialist knowledge on this subject was obtained by Jagersma and the Building Science students working in close collaboration with industry professionals. The result speaks to the quality of work undertaken by students from both architecture and building science, as well as the input from interdisciplinary practices such as Stephenson & Turner. Academic staff members have covered the competition in papers published over the past few years (Danielmeier, 2011[2], Marriage, 2010[3], 2011[4], 2012[5]). The project also attained First Prize in Clever Wood Solutions at the NZ Timber Design Awards in 2011 and won a New Zealand Architecture Award for International Architecture at the NZIA awards in 2013 – the only time a student project has ever won the top NZIA award. The four original students completed their work as Master of Architecture thesis projects (Farrow, 2012; Jagersma, 2012; Nuttall, 2012; Officer, 2012). The four student theses tell the story behind the story: each of the students examining a different aspect of the project,

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[2] Tobias Danielmeier, "Communication Strategies for the Solar Decathlon 2011 - Lessons from the New Zealand Entry *First Light House*" (Australia: Australian Solar Energy Society, 2011Guy Marriage, "Building Reality: Results from the FirstLight House Student Project," 45th Annual Conference of the Australian and New Zealand Architectural Science Association (Sydney, ANZAScA, 2011); Guy Marriage, "First Light: Reflection on Prefabrication," 46th Annual Conference of the Australian and New Zealand Architectural Science Association, (Griffith, ANZAScA, 2012).

[3] Guy Marriage, "Building the First Light house: applied research in sustainability". 44th. Annual Conference of the Architectural Science Association, (Auckland, ANZAScA, 2010).

[4] Guy Marriage, "Building Reality: Results from the First Light House student project". 45th. Annual Conference of the Australian and New Zealand Architectural Science Association, (Sydney, ANZAScA, 2011).

[5] Guy Marriage, "First Light: Reflection on Prefabrication". 46th. Annual Conference of the Australian and New Zealand Architectural Science Association, (Griffith, ANZAScA, 2012).

closely following their primary roles in the project. Farrow's thesis (2012)[6] examines the work to the interior, Nuttall (2012)[7] writes of the planning logistics and building of the project, Jagersma (2012)[8] details the mechanical, electrical and seriously technical parts of the project, while Officer (2012)[9] discusses the trials and tribulations of trying to select the right management structure to guide the project. As would be expected on a project of this complexity, all of these aspects had issues at various times, and indeed the project is revealed to have been at the brink of cancellation on more than one occasion. What may have saved it is that the project was bigger than just a single faculty and had critical buy-in from all the other collaborating faculties involved. The interdisciplinary aspect of the project ensured some form of stability.

University profile enhancement

The University's aims for the Solar Decathlon project have never been fully outlined publicly. While support from the higher echelons of the University was readily forthcoming in the backing of the project and the mandate to 'go there and win', there were perhaps further unwritten goals for First Light. One of these was to raise the public and global profile of the University. This was achieved; the First Light project was highly successful at raising awareness via many different media. Official media releases had to conform to the dictates of the Solar Decathlon governing body in the USA, and thanks to the media team at First Light, media interest was high. The high quality graphic standards of the project were rigidly enforced through guidance from Chris Meade at Designworks. The high technical standards achieved are attributable to the excellent support that the team received from key sponsors such as Leap (hot water), Mitsubishi Black Diamond (solar cells), and Fisher & Paykel (electrical appliances). For instance, Mark Elmore, technical director at Fisher & Paykel, authorised a special production of a 2-burner ceramic induction hob for the project, hitherto not available to the New Zealand market. The whole project was, in public relations terms for the University, money well spent on raising the public profile of the University and attracting more foreign students to the Schools of Architecture and Design. Arguably, the project is the most high-profile student architectural project ever staged by a New Zealand university.

Pedagogical challenges and successes

Attempting to retrofit the project into a standard university course structure was problematic. The standard arrangement of courses in the BArch, BAS and BBSc degrees at Victoria University was devised to give students a rounded education through set courses that span the breadth of several years, through trimesters of twelve weeks each. The First Light project, on the other hand, required a continual presence of up to thirty hand-chosen

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[6] Anna Farrow, "Inside the First Light House: Interior Design for New Zealand's Entry into the U.S. Department of Energy's Solar Decathlon 2011" (Wellington, Victoria University, 2012).
[7] Eli Nuttall, "The First Light House: Logistics and Construction: Victoria University of Wellington's Entry into the U.S. Department of Energy Solar Decathlon 2011" (Wellington, Victoria University, 2012).
[8] Ben Jagersma, "The 10 day bach: A net zero energy home: A story of the design and operation of the First Light house in the 2011 Solar Decathlon" (Wellington, Victoria University, 2012).
[9] Nicholas Officer, "Everything but the building: Project Organisation, the First Light house, Solar Decathlon 2011" (Wellington, Victoria University, 2012).

students to work for up to a year designing, drawing and constructing a single project – an intensely technological one-bedroom house powered solely by the sun. The standard model of students being present for twelve weeks and then going away on a three-month long summer break was not appreciated by the organisers of the project, who faced periods of their workforce having to go back to their home towns to work over the university holiday period to finance their studies. The continuity and commercial reality of a real-life project is in strong contrast to that of the typical student architecture school experience, where projects are experimented on in studio, with sketchy drawings produced and artistic renditions captured, but no real live testing of the design concepts are produced as a full-size built finished product. Here, the reality of one finished building, complete down to the last screw and bolt, was an intense learning experience beyond what any of the students had attempted (or completed) before.

Despite these difficulties, the pedagogical success of this project was significant. The leading four students completed MArch degrees based on the Solar Decathlon project. Knowledge acquisition by these four students was intense and diverse, including: dealing with CEOs of major companies (hence overall key project sponsorship by Meridian Energy), presentations to over 50 different companies and industry organisations, regular meetings with the Vice-Chancellor and the Pro-Vice-Chancellor as well as weekly meetings with the Head of School, meetings and presentations with the former Prime Minister (Hon. Helen Clark), Minister of Finance (Hon. Bill English), Government Science Advisor (Dr. Peter Gluckman), the New Zealand Ambassador to the USA (Hon. Mike Moore), etc. This core team of four young architectural graduates has gone on to develop their own company First Light Studio (FLS) and are now working in a highly collaborative manner within the prefabricated housing industry.

Most importantly, the wider team of 26 students on the project also gained significant benefits. Hard work was undertaken for long hours, and 4-8 weeks spent in Washington D.C. assembling, running and disassembling the house, through the mechanism of new, multidisciplinary, elective courses set up by the School of Architecture, with specifically First Light oriented objectives. Issues such as a maximum number of elective courses also came into play, with students disinclined to enrol in further courses if they could not accumulate credits that they could use on their current degree. Other issues included the stark reality that the Solar Decathlon competition required a dedicated member of the team to be the Health and Safety Officer (HSO) – so while some members of the team got to design and draw and build, the HSO instead had to sit and watch safety videos in order to pass the USA's required level of safety standards: ultimately far less fun.

Students still had to complete their regular studies as well, and some lecturers seemed at times unaware of the significance or importance of competing in the Solar Decathlon project. Requests for leniency and alternative assessment methods to meet course objectives were not always met with agreement and in some (rare) cases, students had to drop courses so that they could partake in the First Light project. As an example of a more collaborative approach, an alliance was set up with Fanshawe College in London, Ontario (who had not been successful in entering the Solar Decathlon themselves, but both their staff and students were keenly willing to help), volunteering to twice drive a return trip of 1700 km across North America to assist in the project assembly and disassembly phases. The most important aspect to consider is the benefit to the students across the wider school. With some architecture classes re-oriented towards the First Light project, there

was a perceived risk that the more regular projects normally undertaken (e.g. a regular project such as design of a museum or art gallery) were not being covered by a project which, no matter how complex it seemed, was still just a very small house. Educators needed to balance the learning outcomes of being involved with a high stakes collaborative and interdisciplinary project such as First Light and the subsequent acquisition of specialised knowledge in that small field, with the wider view – albeit less intensely focused – afforded by a regular, more general project topic. Coupled with this was the knowledge that while 20-30 students were selected to go overseas to work on the house project in Washington D.C., the remaining 100-200 students from their year would not leave New Zealand. Was the experience of the remaining stay-at-home students worth the extra hard work? The general consensus of the students involved appears to be "Yes!" Despite not making it into the final group bound for the USA, there still was a strong sense of residual pride that they were involved with a world-class project of this sort, an unparalleled awareness of the interdisciplinary components of a complex project, and a significant addition to their C.V.

Alternative routes to success

Following the success of the VUW entry, Australian universities also became interested in entering the Solar Decathlon competition. Representatives from University of Wollongong (UoW) came to New Zealand to discuss the way forward with representatives from VUW, and it was evident that they had one significant advantage over the VUW model – they already had a team structure at UoW that tackled a large collaborative project every year. For UoW, their regular project at the School of Engineering was to design, build, and run the resulting car in the Formula SAE Grand Prix. Wollongong's success and continual involvement in Formula SAE has left the University with significant institutional knowledge on how to run an annual student-based learning project. This was evident in UoW's entry "Illawarra Flame" to the 2013 Solar Decathlon China competition, where they succeeded in taking out the First Prize overall, beating all the home territory Chinese teams.

UoW succeeded by collaborating with another tertiary institution, the local TAFE (Technical and Further Education) technical college. In the 2011 competition, an equivalent pairing with VUW might have been to team with students from WelTec, or Whitirea Polytechnic, or with the Schools of Engineering at the University of Auckland or Canterbury. For a number of reasons, this did not happen. Instead, a construction company Mainzeal was contracted to build the house for VUW (despite Mainzeal not being a residential builder). Awkwardly, shortly after the completion of the project (but for wholly unrelated reasons), Mainzeal went into bankruptcy, collapsed and disappeared; thus the chance to commercialise the First Light House at that stage was lost. Happily, the loss of Mainzeal has meant that the four original graduates in First Light Studio have picked up that role and continue to commercialise the successor to the First Light House.

Figure 1 (on the left). Solar Decathlon houses on the National Mall, Washington D.C. 2011
(image: The Field of Dreams. Photo credit: Stefano Paltera/U.S. Department of Energy Solar Decathlon)
Figure 2 (on the right). Solar Decathletes en masse on final prizegiving day, 2011.
(image: Big Team photo. Photo credit: Stefano Paltera/U.S. Department of Energy Solar Decathlon)

Figure 3 (on the left). Nick Officer giving public talk outside the First Light House, 2011.
(image: Nick. Photo credit: Stefano Paltera/U.S. Department of Energy Solar Decathlon)
Figure 4 (on the right). Installation of module 5 on site, 2011.
(image: Firstlight Mod5. Photo credit: Ron Blunt).

Conclusion

In retrospect, the university should probably have made some different decisions: to further widen the team base, to bring more of the construction 'in-house,' as well as adaptation of the standard student curriculum to allow for such a radically different learning program. While the results from the project were great for the university as public relations, as a means of teaching the project created challenges. Some of the team members who worked the hardest on the project did not achieve the required academic levels in other courses in which they were enrolled, and even failed some courses – purely because of their dedication to the overall project. While that is admirable in the case of the individual student, it is likely seen as less admirable in the case of the student's parents. Educators need to balance that widespread general degree learning with the ability to acquire intensely focused specialist knowledge gained within programs such as the Solar Decathlon. This is not a simple task: the plain truth is that the standard means of running an undergraduate architecture degree program do not necessarily correspond well with the needs of a single-focus interdisciplinary

and collaborative project such as the Solar Decathlon. Yet the needs and the desires of the students were strong and universities would benefit from evolving their curriculums to adapt to such projects. On hearing about the Solar Decathlon 2011 entry, the question often asked by fresh young students is: 'when are you doing it again?' The answer so far is – 'it is a student-led competition – that is up to you.'

Figure 5 (on the left). Roof panels being assembled on site, 2011.
(image: First Light Studs. Photo credit: Ron Blunt).
Figure 6 (on the right). Students building scale model of First Light Junior, to test buildability, 2011.
(image: FLJteam6. Photo credit: Carrie Speirs).

Figure 7. Solar Decathletes gather on front deck with former Prime Minister Helen Clark, 2011.
(image: Firstlight team Helen. Photo credit: First Light).

Queensland University
of Technology

A laboratory for design-directed research.
Building design scholarship and academic possibility
through designing

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Abstract
Designing is an experimental practice. Eschewing traditional concepts of designing as simply solving problems, and ideas of research as a positivist pursuit of truth, Landscope DesignLab embraces an expansive perspective of design-directed research. Using the tools of questioning, collaborating, designing, grounding and communicating, the DesignLab explores the terrains of possibility. Working within an inter-disciplinary milieu fosters strong connections, and seizes the generative possibilities of problems, questions, absences, and data.

Keywords: design-directed research, innovation, collaboration.

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Within university-contexts, design is increasingly being framed as experimental. There is a shift from the exemplary to the investigative, and from the singular outcome to a suite of scenarios[1]. It is within this changing constitution of design research that Lincoln University's Landscope DesignLab operates. Design as Laboratory presents a challenge for those who continue to consider design as merely in the service of 'solving a problem,' or design outcomes providing the content for examination as a case study or exemplar. Each absents design's value as a vehicle for exploring new terrain.

The challenges of design-directed research are amplified in spatial design disciplines, as research methods have traditionally been borrowed from other academic paradigms with design as the 'subject' of research, rather than the 'method.' Here, within an Aotearoa New Zealand perspective research audits of universities reinforce such norms. In the most recent review of research quality that covered research activity across all of New Zealand's tertiary sector, design outputs accounted for 0.46% of all major 'nominated research outputs' while journal articles and book chapters totalled 75.8%.[2] In research, design and synthesis are arguably more readily described than applied as a method of inquiry.

The challenge is to transform a research paradigm in which, as Carter so deftly puts it, "knowledge and creativity are conceived as mutually exclusive".[3] Carter observes that "while 'creative research' ought to be a tautology, in the present cultural climate it is in fact an oxymoron".[4] The key here is that the relationship is only oxymoronic in the 'present cultural climate,' reflecting the way in which the prevailing positivist paradigm dominates research activity. Researchers within creative disciplines are often faced with the challenge of needing to quantify or defend 'research outputs' in terms that come from the language of positivist science.

The problem is that, according to creative practice researcher Steve Strange, "'Creativity' is seen as an amorphous, irrational concept; 'research' a rationalising force tied to the institutional nature of the academy".[5] This split between creativity and knowledge is recent and reflects the scientific paradigm of the last couple of centuries. The severing of the subject and the object has much to answer for in terms of the de-coupling of creativity and knowledge. Agamben reminds us that, "For Antiquity, the imagination, which is now expunged from knowledge as 'unreal,' was the supreme medium of knowledge".[6]

Further, when design research is considered there is a tendency in design disciplines to focus scholarship on the discursive framing and reframing of what design research is. This results in an implicit academic caution; that until design's role in research is collectively defined and agreed to, attempts to research through designing should be deferred. This

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[1] Richard Weller, "Boomtown 2050: Scenarios for a rapidly growing city". Richard Weller and Tatum Hands, Building the Global Forest.

[2] Tertiary Education Commission, *Performance-Based Research Fund Evaluating Research Excellence – the 2012 Assessment*, (Wellington New Zealand, 2013), 32.

[3] Paul Carter. *Material thinking: The theory and practice of creative research* (Melbourne: Melbourne University Press, 2004), 8.

[4] Paul Carter, *Material thinking,* 7.

[5] Shane Strange. "Creative research: A radical subjectivity?," *TEXT* Special Issue 14 (2012), accessed 17 March 2014 http://www.textjournal.com.au/speciss/issue14/Strange.pdf, 5.

[6] Giorgio Agamben *Infancy and History: On the Destruction of Experience* (London: Verso, 1993), 11.

intent, while noble, keeps design disciplines at the door of a mode of inquiry that the field is yet to enter.

Yet examining and experimenting in the role of designing in research remains important. Back in 2001 Lily Chi set through five interrelated questions a skeletal framework for considering research through designing: "In what ways can design work's very specificity and finitude offer a medium of investigation for questions of broad concern? How do the creative and discursive interact? How does individual imagination figure in the deliberation of sociocultural matters? What role does the created artefact play in the conjectural process? How, in short, can design as design be practised – and read – as a pursuit of knowledge, understanding?" (Chi 2001: 250)

In the School of Landscape Architecture at Lincoln University, Landscope Designlab is actively pursuing a research agenda where design is its core research method. Students and staff within the DesignLab explore research questions in ways that foster collective endeavour, and include research and researchers from other disciplinary areas. In this both landscape architecture and architecture offer a potent context for operating a laboratory approach, since it is a discipline built on the nexus of art and science. As design theorist Richard Buchanan argues, drawing upon the observations of John Dewey, it is precisely this interplay between science and art that is key to embracing design-directed research. Contrary to a positivist position, it is not, as Buchanan points out "science as primary and art as secondary".[7]

Landscope DesignLab seeks to examine, and in the process consider the capacity of design-directed research to generate options, opportunities and value other than those being identified elsewhere. In this paper we discuss projects undertaken with the DesignLab, including Ararira/Yarrs, The Eden Project New Zealand, and Punakaiki. We identify five strategies that are core to research within a design laboratory: questioning, collaborating, designing, grounding and communicating.

Questioning

Research can be too often motivated by the presumption of finding (and asserting) The Answer. However, a key strategy for building value is to frame projects around a process of active questioning. Sarah Whatmore describes this as "the joy of *not* knowing".[8] And as landscape theorist Thomas Oles puts it, "Do not rush to answers, savour the asking".[9] We draw on the insight of the field of design thinking, which recognises the need to challenge this 'rush to answers,' and instead recognises the value in not over-simplifying the problem.

Design theorist Charles Owen's identifies the importance of explicitly exploring the framing of problems before they are solved; to first ask 'what to make?' before leaping towards 'how to make it?'[10] Owen explains that the abbreviation of design thinking, so

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[7] Richard Buchanan, "Wicked Problems in Design Thinking," *Design Issues* Vol. 8, n. 2 (1992): 5-21, 7.

[8] Sarah Whatmore 'Generating Materials,'. in M. Pryke, G. Rose & S. Whatmore (Eds.), *Using social theory : thinking through research* (London ; Thousand Oaks, Calif.: SAGE in association with the Open University, 2003), 98. [her emphasis].

[9] Thomas Oles *Go with Me: 50 Steps to Landscape Thinking*. (Amsterdam: Architectura & Natura Publishers, 2014), 109.

[10] Charles Owen, "Structured Planning in Design: Information-Age Tools for Product Development", *Design Issues,* Vol. 17, n. 1 (2001): 27-43.

that it simply becomes 'what to make?', becomes a one-step process is where 'an already determined concept is turned into a specification' thereby already limiting the possibilities of the designing process.

This is very pertinent to landscape architecture, where a tradition of dealing with 'the site' can result in looking only towards site solutions in the exploration of a question. However, it may not be the site that holds the innovative potential for exploring the question – there may be more imaginative scope in an expansive framing, investigating for example the prospect of a hand-held device as much as a designed place, or an item of footwear as much as a boardwalk.

Projects are most powerfully framed around research questions that are honed through a multidisciplinary literature review. Selecting research questions of active interest to other academic fields allows comparison of design-based findings with results from other disciplinary fields and methods[11]. For example design-directed research within the lab uses work by tourism geographers working in the field of protected areas and wilderness values to provide a platform of peer-reviewed research from which to generate questions. Tourism geography has identified a generally agreed position where wilderness is something that can only be diminished and lost. Multiple studies over the last twenty years continue this positioning with the following emblematic: "further work will also demonstrate the rate at which wilderness is declining, through changing perceptions and development patterns, and it is hoped that this [research] will provide the basis for the preservation of wilderness on one hand and the opportunity to maximise wilderness experiences for as many as possible on the other"[12].

Within the lab this underlying premise of a reducing wilderness is critiqued, with the challenge and interrogation becoming generative in design terms, with questions like: can wilderness be created; can the mechanisms by which it is created be designed; and what forms could such mechanisms take? These investigations have drawn on phenomenological framings of landscape that can stimulate and strengthen 'practices of the wild' and with it increase wilderness's perceptual, conceptual and physical realm[13]. Design interventions have taken the forms of wayfinding systems, apps and volunteering projects[14].

Questioning as a core strategy in working with the design laboratory emphasises research as active, rather than the passivity which can result from selecting a topic. A focus on a defined topic tends to lead to closing down rather than opening out. One of the useful tactics in opening-out is a form of questioning known as the Five Whys (championed by design consultancy IDEO), an approach which peels layers off assumed understandings of a situation, and like Owen's graph can cast a problem into a very different context. Industrial engineer Gary Jing offers an example of how the Five Whys can derail path dependency in the exploration of a design problem, noting how at the Jefferson Memorial

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[11] See John Law, *After method: Mess in social science research*, (London: Routledge, 2004).

[12] Geoff Kearsley, Andy Kliskey, James E. S. Higham, *Perception of wilderness in the South Island of New Zealand: a multiple images approach* (Dunedin, N.Z.: Centre for Tourism, University of Otago, 1999): 20.

[13] Mick Abbott, "From Preserve to Incubator: Giving a New Meaning to Wilderness", in M. Abbott and R. Reeve (eds.). *Wild Heart: the Possibility of Wilderness in Aotearoa New Zealand* (Otago University Press, Dunedin, 1999).

[14] Mick Abbott, "Practices of the wild: a rewilding of landscape architecture". *LA Plus* (University of Pennsylvania, 2015), 1: 34-39.

in Washington DC, an issue with crumbling stone had arisen[15]. Rather than simply treating the stone itself in the rush to find an answer, unpacking the problem repositioned the challenge:

- Why does the memorial deteriorate faster? Because it gets washed more frequently.
- Why is it washed more frequently? Because it receives more bird droppings.
- Why are there more bird droppings? Because more birds are attracted to the monument.
- Why are more birds attracted to the monument? Because there are more fat spiders in and around the monument.
- Why are there more spiders in and around the monument? Because there are more tiny insects flying in and around the monument during evening hours.
- Why are there more insects? Because the monument's illumination attracts more insects.

Through researching the problem the imaginative scope for this landscape-based problem was revealed not to simply fix the stone, but to turn the lights on an hour later each night, thus avoiding the infestation of tiny insects.

Collaborating

Design as laboratory invokes a sciences model, emphasising collective research, where different research teams work on key aspects of shared questions. As a physical, shared space the DesignLab establishes a collaborative research setting which fosters ongoing discussion and exploration, where intensive moments of ideation can be at the same time tested and critiqued. This is in distinction to the 'study alone' office settings that are the norm for most humanities-based researchers. The concept of the lab draws on science as a model, particularly in recognising the potency of co-operative and collective research activity.

Figure 1. Punakaiki Project, www.designlab.ac.nz

Central to a strategy of collaboration is the fact that not-collaborating is a risky business. Adopting an autonomous and non-collaborative stance when involved in problems in a landscape setting would profoundly limit the prospects for innovation. No one, and no

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[15] Gary G. Jing, "Flip the Switch," *Quality Progress*, October (2008): 50-55.

discipline, alone holds the breadth of knowledge needed to effectively explore problems. Landscope DesignLab projects actively engage with other disciplines within the university, as well as wider stakeholders. The Punakaiki project, working with Rio Tinto, Conservation Volunteers NZ, Department of Conservation and ecologists from Lincoln University, seeks to increase the ecological potency of a retired mining site. Landscape architecture sought to express a desire for citizen science into an integrated, site-based expression of 'voluntourism', and collective restoration as a vehicle for transferring the land into neighbouring National Park through the very actions of people. In this research it was identified that National Parks have the capacity to afford experience that support widely held values of conservation, including protecting the environment, native species, and the country's green image, and beyond default activities of walking and camping[16] (Figure 2).

Figure 2. Ararira Wetland Project, Te Waihora, www.designlab.ac.nz

In another design-directed research project collaboration with dairy companies, conservation managers, community trusts and interaction designers led to a crowd-sourced planting practice and resulting form that explicitly expressed through the actions of people forms of eel, inaka and/or river forms to build place attachment within public conservation lands (Figure 3).

Designing

The focus for DesignLab is working within research questions that are engaging a number of disciplines such that design's role is focused on increasing the imaginative scope and innovation potential, supporting methodological strengths in design including scenarios,

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[16] Department of Conservation, Department of Conservation National Survey Report 4: Attitudes to Conservation, Wellington, 2011, 7. http://www.doc.govt.nz/Documents/about-doc/role/visitor-research/attitudes-to-conservation.pdf.

design, synthesis and diagramming.[17] Design-directed research enlists both generative processes such as ideation, as well as analytical techniques like critique.

Designing is not undertaken with the intent of producing abstract exemplars. Rather the process is more restless: an opening out of terrain rather than placing a declaratory stake in the ground. In drawn form it concurs with architect Frank Gehry's statement: "If you watch me draw—actually draw—you'll see it's a frantic kind of searching".[18] Strategically this process takes on multivalent characteristics including applying multiple programmatic drivers with which to build possibility. In work undertaken to imagine a 'Drylands Park' in New Zealand's Mackenzie Basin, a distributed form evolved that at times accommodated multiple forms of protection, elsewhere pan-region trails, pastoral grazing, tourism ventures and farm-based experiences (Figure 4).
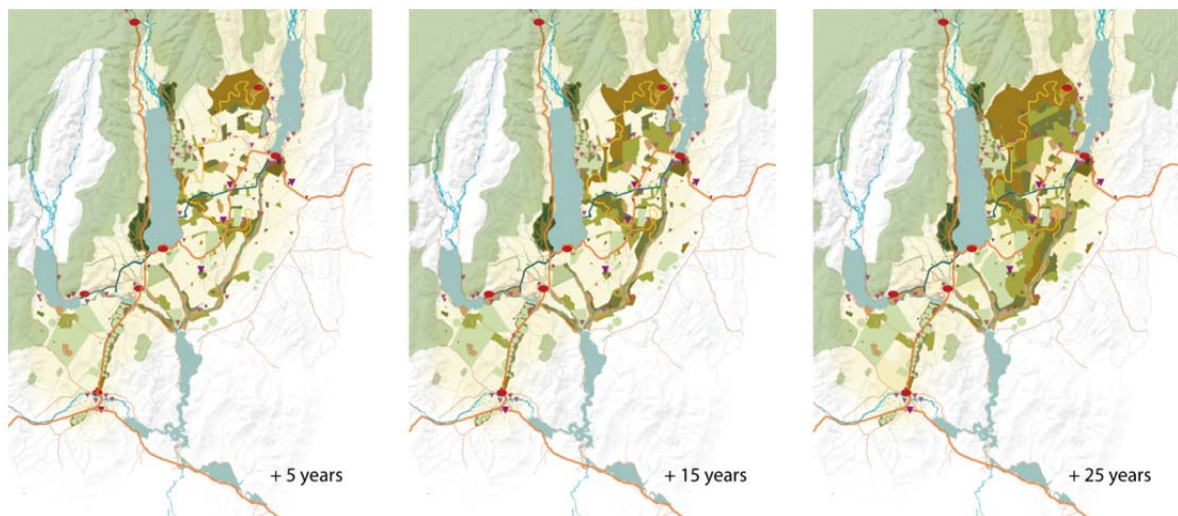
Figure 3. Mackenzie Basin Distributed Park, www.designlab.ac.nz

Such methods apply the use of matrices to facilitate cross-pollination, bringing together elements which may not have been used in an interrelated way before, like the 'knight's move' – the oblique operation where things not linearly connected are combined in unexpected ways.[19] In Figure 5 students at Lincoln University's School of Landscape Architecture are undertaking a concept generation activity to shift communication-centric design proposals focusing on individuals to those that emphasise interaction and the building of social value. In the exercise, concepts are located according to two axes: individual-collective and communication-interaction. Students then determine design strategies to 'shift' their concepts further along the collective and interaction continuum.

[17] See Carter, *Material Thinking* and James Corner, "Eidetic operations and new landscapes," in *Recovering landscape: essays in contemporary landscape architecture*, ed. James Corner (New York: Princeton Architectural Press, 1999), 153-169.
[18] Bickford Arnell, *Frank Gehry: Buildings and Projects, (*New York: Rizzoli, 1985).
[19] Viktor Shklovsky, *Zoo, or Letters not about Love*, (Emwood Park, IL, Dalkey Archive Press, 2001), 103.

Figure 4. Students using a matrix to generate design responses, Charlotte Murphy

A quadrant approach based on intersecting axes, or 'quattro stagioni,'[20]can similarly be both analytical and generational, where the two axes set out a field of possibility. In the context of memorial design, we used this approach to critique existing memorials in terms of their form and their temporal qualities. A formal continuum between object and place, and a temporal continuum between static and changing were set up to provide an armature for critique. Opposing these two axes creates the more powerful design-based device of the four quadrant array. Utilising the opportunity of a workshop with practitioners familiar with emotions and rituals, the quadrant tool was used as a kind of crowd-sourced design critique. The workshop sought to identify the ways in which memorials can operate, and the example here is based on an analysis of the Gibellina Earthquake Memorial in Sicily. Each practitioner recorded their responses on the axes, and these were subsequently overlaid to reveal areas of concentration, and areas of absence (Figure 6). The distribution of dots – each reflecting one person's critique – reveals how the reading of one site can be nuanced across a range of interpretations. Design generation can subsequently be leveraged off an analysis process such as this, where the process of questioning can prompt exploration and create briefs. For example, what is a memorial which is a changing object, versus a memorial which is a changing place? How can a memorial be both static and changing? And perhaps both object and place?

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[20] 'Quattro stagioni' is Four Seasons, with reference to the pizza topping that has four different flavours dividing the circular pizza into four quadrants. This term was first used in the context of design thinking by Wolfgang Jonas, drawing on the work of Peter Schwartz, *The Long View* (Doubleday).
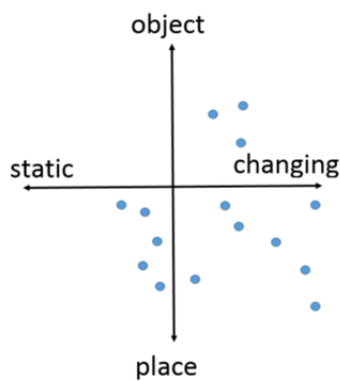
Figure 5. Mapping to identify spread of design critique positions across a range of practitioners for a specific memorial design. Values of place takes priority over object, while perceptions of the memorial according to static and changing dimensions are evenly split. Jacky Bowring

Grounding

Context, environment and project are never generic. Design-as-laboratory seeks out in the tangible a test bed for the value and validity of theoretical frameworks.[21] Landscope DesignLab grounds research in place, recognising how creative research must be simultaneously within the universal and the local. Paul Carter expresses this eloquently with an analogy to weaving:

> The warp is composed of the threads extended lengthwise in the loom. These can be thought of as the culture's myth lines, the grand narratives in terms of which it defines its sense of place and identity. But these linear narratives can neither cohere to form a pattern nor be subverted and overturned, unless the shuttle of local invention is at work, casting its woof-thread back and forth, over and under the warp-threads. Only in this way can cultures collectively gain agency over their story lines, learning to become themselves at this place. But to take control in this way, to represent a society locally reinventing itself, the shuttle has to *advance*, creeping progressively crosswise along the warp.[22]

Landscope's Eden NZ project is borne on the strategy of grounding. While the originating concept of an immersive environment with exhibition and education dimensions stems from Cornwall in the U.K., the New Zealand iteration is emphatically of this place.   The location, form and focus of Eden NZ are about here, and they explore the question at the core of the project: how might a significantly degraded environment be used as an opportunity for re-focusing Christchurch's relationship with its waters and lands, and values of Mahinga Kai, in the twenty-first century? The site of exploration is in Christchurch's residential red zone, an area necessarily abandoned following the earthquakes of 2010 and 2011. One impact of the earthquakes was to lower the land level, which had the consequent effect of increases in flooding, raising questions over possible scenarios for cities faced by rising sea levels.[23] With water, rather than Eden UK's plants, as a focus, this project is tuned into issues that are pressing at global, regional and local levels. It is not only inundation with water that is being explored, but Canterbury, the province in which Christchurch is located, has a relatively dry climate and irrigation is both a problem and an opportunity in the highly modified landscape. Sails

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[21] See Law, *After method.*
[22] Carter, *Material Thinking,* 11.
[23] Nicki Copley, Jacky Bowring and Mick Abbott, "Thinking ahead: design-directed research in a city which experienced fifty years of sea-level change overnight". *JOLA: Journal of Landscape Architecture*, (Taylor and Francis, 2015), 2: 78-89.

speak of ocean migrations, plantings of ecological restoration and rivers of revitalised aquatic ecology. Here design is negotiating Christchurch's transition – both materially and perceptually – from its location on the plains – a landscape – to its place within rising seas and aquifers – a waterscape as well. The woof-thread carries these water stories through the overarching warp threads of wider narratives, with Eden NZ becoming the place of grounding that is derived from its environment rather than brand (Figure 7).
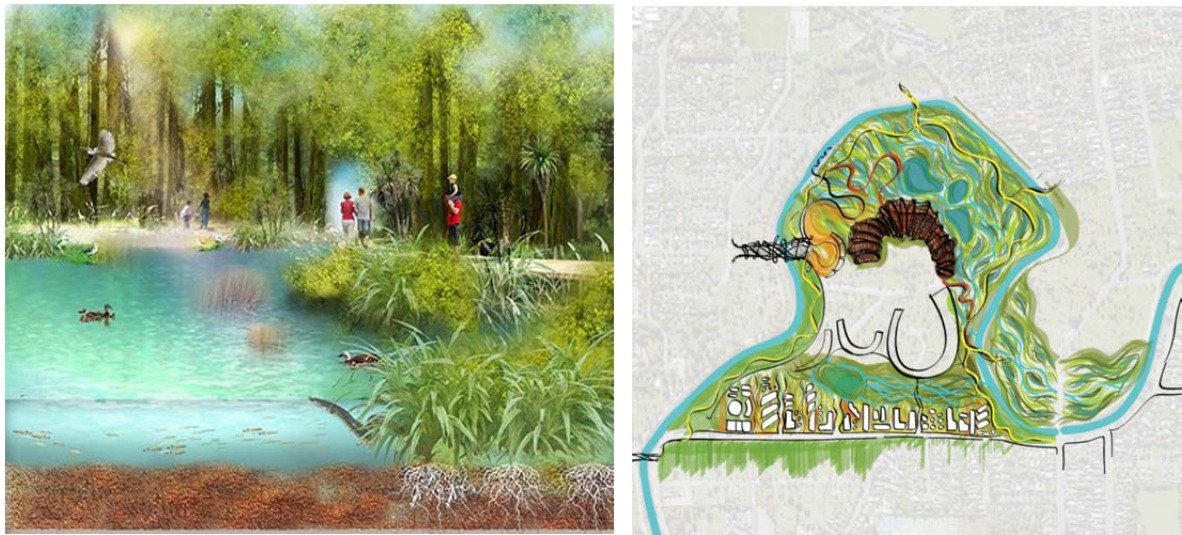
Figure 6. Ki Uta Ki Tai / Mountains to Sea Eden Project, Christchurch Red Zone, www.designlab.ac.nz

Communicating

Perhaps the most powerful added value in creative research comes with its communication. Landscope DesignLab, committed to presenting findings so researchers in other disciplines, can incorporate findings into future research projects and/or wider stakeholder applications. Design has particular strengths in generating compelling visual, time-based and three-dimensional form that make comparative differences, and analysis, readily discernible. As part of the wider collaborative process, the communication of findings is a value that design brings to the table.

Images do not only represent, they enable. Elsewhere we have considered Moir's 1925 map of Fiordland and statements of 'unexplored at present' that is written across blank areas.[24] Not only does this describe the current condition but also it instrumentally shapes a changed future condition. It was this map that prompted people to travel to these areas to explore and change its existing status. Imagery developed by the lab for Te Whenua Hou (Figure 8) provided the impetus for the subsequent planting regime which has led to a further 750,000 native species to be planted that forms a bridge for birds (mimicking the form of a braided river) that connects the Southern Alps to Banks Peninsula.

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[24]Mick Abbott, "Visualising a Temporal Cartography of Wilderness Travel", in Antoni Moore and Igor Drecki (eds.) *Cartographies for Tomorrow: Mapping in a Mashed-Up World* (Springer, Heidelberg, 2013).

Figure 7. Whenua Hou Distributed Forest, Canterbury Plains, www.designlab.ac.nz

Communication of design-directed research must often connect with lay audiences – which range from scientists unfamiliar with the language of design, to stakeholders unfamiliar with both science and design.

Conclusions

While much energy can be used in defending design as a research method, as Cross advises, design researchers "must concentrate on the 'designerly' ways of knowing, thinking and acting. … Design practice does indeed have its own strong and appropriate intellectual culture, and … we must avoid swamping our own design research with different cultures imported either from the sciences or the arts"[25]. The specific design-directed research projects incorporated in this paper demonstrate the possibility and efficacy of design- directed research, and an expanded scope for both landscape architecture research, and also its value for themes of inquiry in the wider academic world.

Here design research is content in that more formless realm of the nearly coming into being – a site that fosters imaginative scope rather than a capacity to render a solution in a manifest of schedules and sub-contracts.

Within research cultures design's new knowledge is not only identified from within its own body of work, but in reference to wider research endeavours drawn from across universities, other research institutions, and research partners. Peer review of the Punakaiki Volunteering Project comes also from the fields of Ecology and Mining

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[25] Nigel Cross, "Designerly Ways of Knowing: Design Discipline Versus Design Science," *Design Issues,* Vol. 17, n. 3 (2001): 49-55.

reclamation[26], work with Te Whenua Hou from ecology, and international farm and landscape practice.[27]

Design-as-Laboratory firmly locates design into the world of research questions and with it charts a course for a strengthening and more strategic role for design that is located at the core of inquiry and scholarly research. As such the Design-as-Laboratory is in itself positioned as form of methodological question, which seeks out experimentation and heterogeneity in approaches that orientates research through designing outward: to proactively introduce itself into wider research sites where values of multidisciplinarity, collaboration and multiple modes of inquiry are fostered.

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[26]CMS Smith, M.H. Bowie, J.L. Hahner, S. Boyer, Y.-N. Kim, H.-T. Zhong, M. Abbott, S. Rhodes, D. Sharp, N. Dickinson, "Punakaiki Coastal Restoration Project: a case study for a consultative and multidisciplinary approach in selecting indicators of restoration success for a sand mining closure site, West Coast, New Zealand2, *Catena,* Vol. 136 (2015): 91-103.

[27] Mick Abbott, Kate Blackburne, Jacky Bowring and Charlotte Murphy, "Fraktales Pflanzen in Aotearoa Neuseeland", *Anthos. The Swiss Journal of Landscape Architecture*, Vol. 3, n. 16 (2016): 42-44.

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Design dialogues.
Ambiguity of "Design" within Architectural Studio

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Abstract

The ambiguous nature of the word "design" offers up a complex dialectic dialogue for the architectural studio lecturers to impart to their students. Discussing the "design", more commonly referred to as the programme or scheme, is quite a different beast to the process or design methodologies the students use to create an architectural proposition or "design". Clarity around this notion of design as both the process, in being design-led, and also as the end result, becomes a necessary task for studio lecturers to inculcate into the student body.

This paper aims to navigate through the mire/path of the design methodologies as adopted within architecture studio teaching at second year level within the Bachelor of Architectural Studies, Unitec Department of Architecture – by way of using the tried and tested notions of First Insight / Empathy, Preparation, Incubation, Illumination, Verification, with the anticipation that these are the essential tools with which to interface teaching and practice, within the context of a "live build project".

Three years' worth of case studies of large scale Interdisciplinary and collaborative "live build projects" in Christchurch in conjunction with the Festival of Transitional Architecture (FESTA) are used to demonstrate and investigate the heuristic design processes that are an integral part of a prospective architect's arsenal of skills. These case studies offered a complex window of tasks, not least that the students were designing in Auckland 1000 km away from the Christchurch sites, and each year posed a different set of problems and clients-related issues. Luxcity 2012 / Canterbury Tales 2013 / CityUps 2014 were the students' responses to FESTA's call to rejuvenate the city centre after the earthquakes of 2010 and 2011, and all of which were assembled only for a 24-hour period over Labour Day Weekend.

Keywords: live build projects, studio praxis, design thinking, interdisciplinarity, collaborative projects.

Design dialogues

The ambiguous nature of the word "design" offers up a complex dialectic dialogue for the architectural studio lecturers to impart to their students. Discussing the "design", more commonly referred to as the programme or scheme, is quite a different beast to the process or design methodologies the students use to create an architectural proposition or "design". Clarity around this notion of design as both the process, in being design-led, and also as the end result, becomes a necessary task for studio lecturers to inculcate into the student body. This paper aims to navigate through the mire/path of the design methodologies as adopted within architecture studio teaching at second year level within the Bachelor of Architectural Studies, Unitec Department of Architecture – by way of using the tried and tested notions of First Insight / Empathy, Preparation, Incubation, Illumination, Verification[1], with the anticipation that these are the essential tools with which to interface teaching and practice, within the context of a "live build project".

Three years' worth of case studies of large scale Interdisciplinary and collaborative "live build projects" in Christchurch in conjunction with the Festival of Transitional Architecture (FESTA) are used to demonstrate and investigate the heuristic design processes that are an integral part of a prospective architect's arsenal of skills. These case studies offered a complex window of tasks, not least that the students were designing in Auckland 1000 km away from the Christchurch sites, and each year posed a different set of problems and clients-related issues. Luxcity 2012 / Canterbury Tales 2013 / CityUps 2014 were the students' responses to FESTA's call to rejuvenate the city centre after the earthquakes of 2010 and 2011, and all of which were only assembled for a 24-hour period over Labour Day Weekend.

According to Professor Sam Bucolo of the University of Technology Sydney: *"design should not be a noun but a verb, he says. 'It's a process and quite a rigorous process.' So how do you think like a designer? 'Design thinkers' start with empathy … 'It's a people-first approach.' Design thinking is also integrative; designers try to draw as many threads together as possible…"*[2]

The word design etymologically is sourced from the Italian word *disegno* meaning to mark out.[3] However this is just its noun form; its verb form comes from the Latin *designare* "*mark out, devise, choose, designate, appoint*"[4]. It also can be used as a "verb used with an object" and a "verb used without an object". In general terms one can assume it means to make a drawing of a work; however, it also is used as a description of "an object of the applied arts". The word *Design* within the Anglo-Saxon cultural norms has morphed and been substituted to describe many other things.

"A recent discourse about design terminology provides an insight into the complex world citing a wide variety of adjectives, nouns, prefixes or suffixes to the word *'Design'*". Alastair Fuad-Luke describes this in his book *Design Activism, Beautiful Strangeness for a Sustainable World.*[5]

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[1] Lawson, Bryan. *How Designers Think: The Design Process Demystified*. 4th ed. Amsterdam and London: Architectural, 2006: 149.

[2] Bucolo, Sam. "Why Do Some Businesses Succeed in a Challenging Environment When Others Fail? A Different Way of Thinking May Be the Answer". *#Think UTS Business School 2014*, 2014: 20-23.

[3] Hauffe, Thomas. *Design: A Concise History* Laurence King, 1998: 10.

[4] Harper, Douglas. "Online Etymology Dictionary". Accessed October 1, 2017. http://www.etymonline.com/index.php?term=design&allowed_in_frame=0

[5] Fuad-Luke, Alastair. *Design Activism, Beautiful Strangeness for a Sustainable World*. Earthscan, 2009: 1.

Figure 1. Students going through health and safety briefings. FESTA 2014. Photograph Annabel Pretty.

This morphing of the word to encompass so much has led to an apparent *design-washing* akin to the so called green-washing / eco-sustainability washing of disciplines which has become an enormous taxonomy problem for not only the designer but also for the general populace. Not only does the prefix *design* get affixed to nearly all the so-called disciplines in Fuad-Luke's diagram, but it confuses both the designer and the amateur to the vast array of design-led frameworks that have co-opted the word when describing the functionality of being design-led. This ambiguity or plurality of the meaning of the word *design* often as not leads to architectural students confusing the process of design with the product of the design, or rather the architectural design proposition. This labyrinthine design paradigm will be partially unravelled by the case studies as demonstrated within this paper.

Framing the design challenge - Luxcity 2012 / Canterbury Tales 2013 / CityUps 2014
The parameters of this paper will deal with the case studies over the three-year period from 2012 to 2014, when architectural students from the second-year programme of the Bachelor of Architectural Studies (largely the entire student cohort roughly of 90 students in 2012, 110+ in 2014 and approximately 30 in 2013) at Unitec Institute of Technology worked with the umbrella organisations of FESTA[6] and Studio [ ] Christchurch.[7] The object was to realise a number of architectural pavilions or rather light sculptural interventions within the former red zone of the aftermath of the Christchurch earthquakes of 4 September 2010 and 22 February 2011. Largely due to the intense size of the architectural projects involved, this paper will really only seek to clarify the design methodology and process outcomes of the Unitec students; this in no way reflects on the other architecture schools or staff but is meant to address the plurality of the nature of the process from within the authors' teaching dimensions.

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[6] FESTA. "Festa - Festival of Transitional Architecture", Te Pūtahi – Christchurch Centre for Architecture and City-making. Accessed October 1, 2017. http://festa.org.nz.
[7] Christchurch, Studio [ ]. Accessed October 1, 2017. https://studiochch.wordpress.com.

Collaborative Design – Framework-Stage 1
The 2012 commencement of the project was pitched to the entire student cohort, led by all lecturers, typically six staff in total. The students were assigned into groups of roughly five with the expectation that they should research other architectural light pavilions and present their findings to a joint audience of Unitec Lecturer's and students plus the students and staff of University of Auckland, alongside former Christchurch Polytechnic Institute of Technology (CPIT) now Ara Insititue of Canterbury and Auckland University of Technology (AUT). An expert panel of external academic and professional practitioners of architecture would judge the fabrication of these transitional architectural pavilions as:

> *The upshot of this was the collaboration necessary between a variety of Architecture schools, to create a design critique for 18-20 projects each of which only 6 would move forward onto the second round of being matched with a client and moving to the pre-fabrication and council permissions. This was a huge learning experience for the students having to give a verbal presentation to students within other universities and to understand the scope of the variety of projects. The projects were ranked according to 1) Design potential; was it feasible from a budgetary and from a locational aspect bearing in mind that the sites which the students designed for were a constantly changing feast due to buildings being demolished, and the Red zone being reduced in size. 2) Did it encompass the elements of a "city of light"? Both in a literal sense and in a pragmatic sense as the predominant number of the students were designing, being based in Auckland for shipping to the site in Christchurch 1082km distance. 3) Was it great transitional Architecture?[8]*

Figure 2. Presentation of all student projects, at University of Auckland. Photograph Annabel Pretty.

Designed by Committee – "*It is a commonly held view that good design results when projects are driven by an autocratic leader and bad design results when projects are driven by democratized groups.*"[9]
Students typically moved through the five stages of design methodologies, seeking research, preparing design solutions, incubating their ideas; however, once they had pitched their ideas to an external panel of professional architects the next phase of the design problem occurred.

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[8] Pretty, Annabel. "Incubating + Scaling - Transitional Large Fabrication Architectural Design Propositions in a Post-Earthquake Environment", Paper presented at *The Virtuous Circle: Design Culture and Experimentation Milan*, 2015: 121.
[9] Grossman, Wendy. "Designed for Life." *New Scientist* 76 (5 October 2002): 236.

The six projects, which progressed to the next phase, meant for a complex blend of personalities, cultures and expectations. This led to a convoluted iteration of the design process as students worked in their groups of five for a period of two weeks following the Empathy or First Insight, Preparation, Incubation, Illumination, Verification theoretical model. Obviously, some groups navigated the tangled, intricate interpersonal relations between students, more fully than others, to realise a potential design outcome. The resultant project was ranked by the external panel as to determine those who should progress to the second stage.

Figure 3. Presentation of all student projects, at Unitec Institute of Technology. Photograph Annabel Pretty.

Collaborative Design – Framework- Stage 2; Re-Framing the Design Methodologies
The numerous component design problems within the brief of at least 16 identifiable components (see diagram figure 4) which were impactful on the incubation of the design, meant that once the groups of five students had merged into a group of between 18-20 students there was a re-framing of their ideas; to blend, merge and reassess the relevance of the ideas in order to then re-frame the solution meant for a complex process.
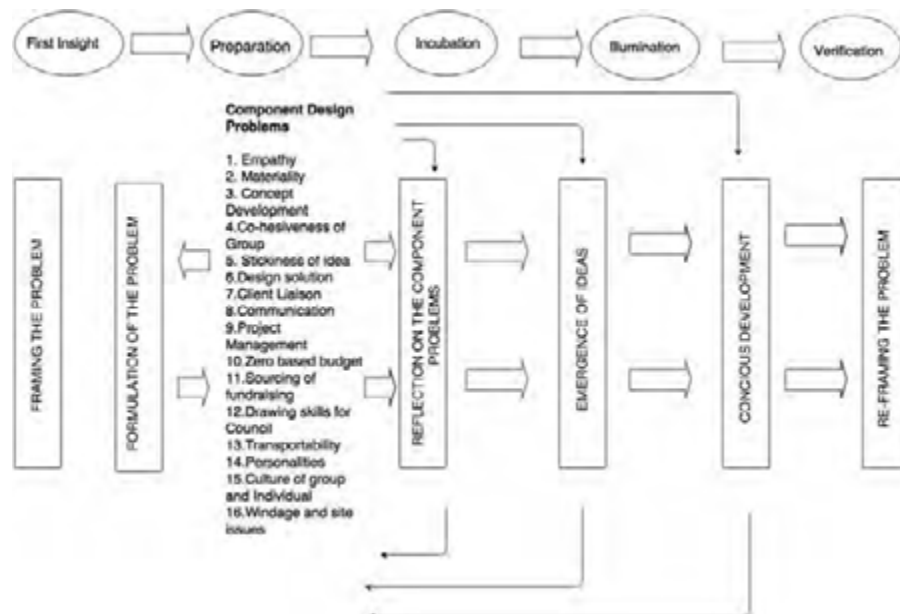
Figure 4. Annabel Pretty interpretation of Kneller's creative process
as applied to case studies within this paper.

Needless to say, the reiteration of the concept of Ockham's Razor became a necessity. Ockham's Razor states, *"given a choice between functionally equivalent designs, the simplest design should be selected."*[10] Ockham's Razor (Latin, *ex parsimoniae,* which means 'law of parsimony') asserts that simplicity is preferred to complexity in design, exemplified by the notion of *"form follows function"* variously attributed to 18th century Jesuit Monk Carlo Lodoli and latterly Horatio Greenough and Louis Sullivan.[11] Though not intended truly for design the concept has been appropriated into the vast array of schematics for working with design methodology. Whereas some groups had a "lead group" that often as not was the design concept, groups were merged together by the tutors involved in order to ensure that at least 16 or so identifiable problems were in different proportions for each group (see figure 4).

Case Study – Archrobatics

To navigate the design process and build a sense of community within a group and to 'glue' the various design methodologies and cultures and knowledge base was a knotty convoluted process. This reframing of the idea or concept was typified by a group in 2012. Team Archrobatics had a complex idea to include immense helium filled balls (two metres or so in diameter) with some of the concepts of previous groups, which included large strung up objects and a complex pulley system. This group went through an intensive reframing led by a number of the lecturers in a bid to work through their ideas rather than the steadfast attempt to hold forth with all the ideas from the five groups. The culmination of this was a need to refine, redefine and simplify in fact to exemplify the concept of *Horror Vacui* – the Latin expression meaning the "fear of emptiness" – to fill empty spaces with information or objects over leaving places blank or empty.

Figure 5 (on the left). Team Archrobatics. Photographs Annabel Pretty.

Lecturers spent vast quantities of time with these students insisting on a clarity of concept and simplicity of ideas. This eventually occurred moments before drawings were needed for council permits. Using the simple idea of using the bird netting normally used to drape around the vineyards, the core concept was a lightweight material that had certain

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[10] Thorburn, W. M. "The Myth of Occam's Razor", *Mind,* 27 (1918): 345-53.
[11] Lidwell, William, Kritina Holden, and Jill Butler. *Universal Principles of Design.* Rockport Publishers, 2003: 106.

stretchiness on the diagonal, which meant that the netting was cut into a sort of scalene triangle that under three points of pressure made for an impactful solution of concept and was in fact, in 2012, one of the most commented about "light pavilions" due to its simplicity of structure.
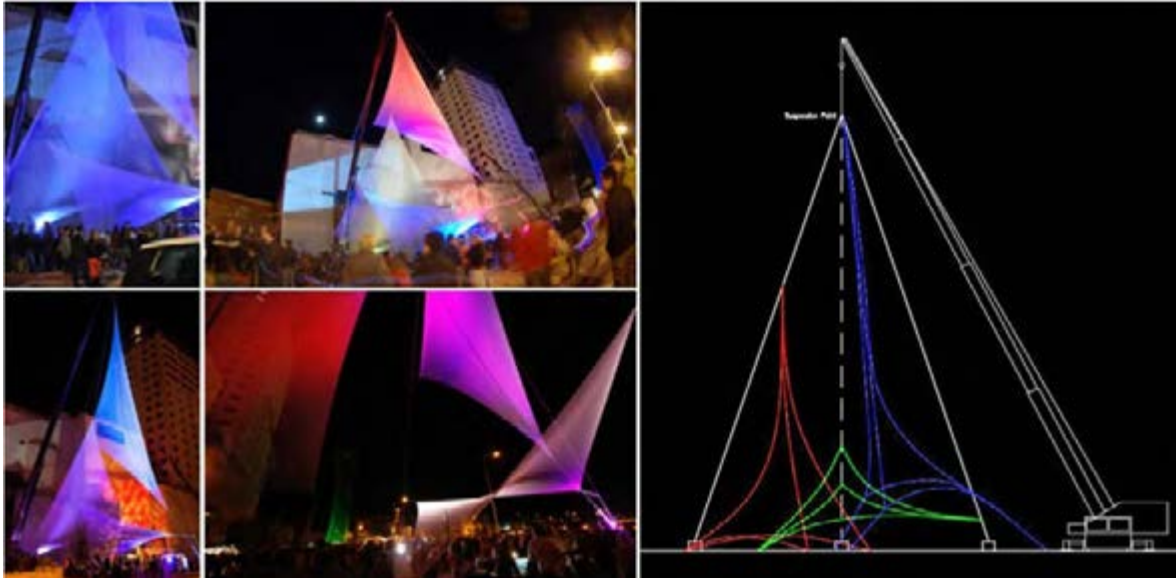
Figure 6 (on the left). Team Archrobatics. Photographs Annabel Pretty.
Figure 7 (on the right). Team Archrobatics, Health and Safety Plan.

Case Study 2013 - Illuminate

2013 saw a slight variation of the way in which the project was run in that the whole cohort of students was not invited to participate so that the final 25-28 or so students blended much more smoothly than in 2012, such that it was easier to manage even though all the design issues were still the same. For example, windage became a huge factor in this project; one of the most successful projects *"Illuminate"* was by a group of students who quickly realised that the LED lights could be sourced cheaply and once taken out of their "housings" were quite easily able to be used in other ways. The concept was to make a modular hexagon repeating lightweight, flexible structure that could be built up creating a dense cloud-like structure that also had the notion of both transparency and translucency. The hexagon structures were created from variously coloured drinking straws that lit up from the LED light source in the centre of the module; since the hexagon was expanded in the middle section it became rather like the concept of quilting to attach the modules together. Much testing to ensure they would endure the pulling and grabbing from the crowd meant that a support system of small sticks was necessary within the drinking straws to reduce the fully flexible system. Ironically the group found that the most practical and easily sourced same-size small sticks turned out to be kebab sticks, which caused quite some issues on their health and safety report as to the ability to ensure that they were all removed safely from the site at the end of the night. Probably the main reason that this was so successful on the day was the ease with which the modular system could be changed due to site specifications (site specification changed regularly). The capacity to raise and lower the structure via four scissor lifts, and the ability to make the structure on site, albeit the students had created the hexagon modules in Auckland and transported them down to Christchurch via excess baggage on the plane, meant for a

very flexible enduring structure. They were able to connect them to make larger modules in the days before the Labour Day opening, which meant for the efficient use of time. The simple structure once repeated, determined for an impactful final resolution of *design* (see figures 5-11).

Figure 8. Team Illuminate. Photograph Annabel Pretty plus Unitec Architecture Department – Asylum 2013.

2014 – Case study Aurora
Aurora was the culmination of three groups pitching their concept to move forward for CityUps 2014: *Aurora* (http://auroralightsnz.wordpress.com), *Inflate* (http://inflatechristchurch2014.wordpress.com) and *Puffed Up+* (http://cityups2014.tumblr.com). *Inflate* dealt with the concept of using car batteries to inflate and deflate a large balloon-like structure; *Puffed Up+* dealt with the concept of recycling plastic bags and creating a sort of structure looking not un-like a bunch of hanging grapes; and Aurora's genesis was from using the childhood toy "slinky" (pre-compressed helical springs), trying to figure out how to scale these up without losing the concept of interactivity. Once the three groups of five students merged, they needed to work through the design processes to determine the most likely design concept that would work, and once they had identified that flexible ducting (air-condition unit ducting) had similar properties to the slinky, the design could move forward. The problem for this group became that once they were one of the teams to have these large 12m x 10m proscenium frames, a system of hanging the ducting became an architectural engineering problem. However, this was resolved by using scaffolding to bisect the large-scale frame to hang the tubing free from the structure. Aurora became one of the most cogent designs of the night due to the interactive nature of the design, with the ability for the audience to interact with one another via "talking down the tube" just like a childhood toy.
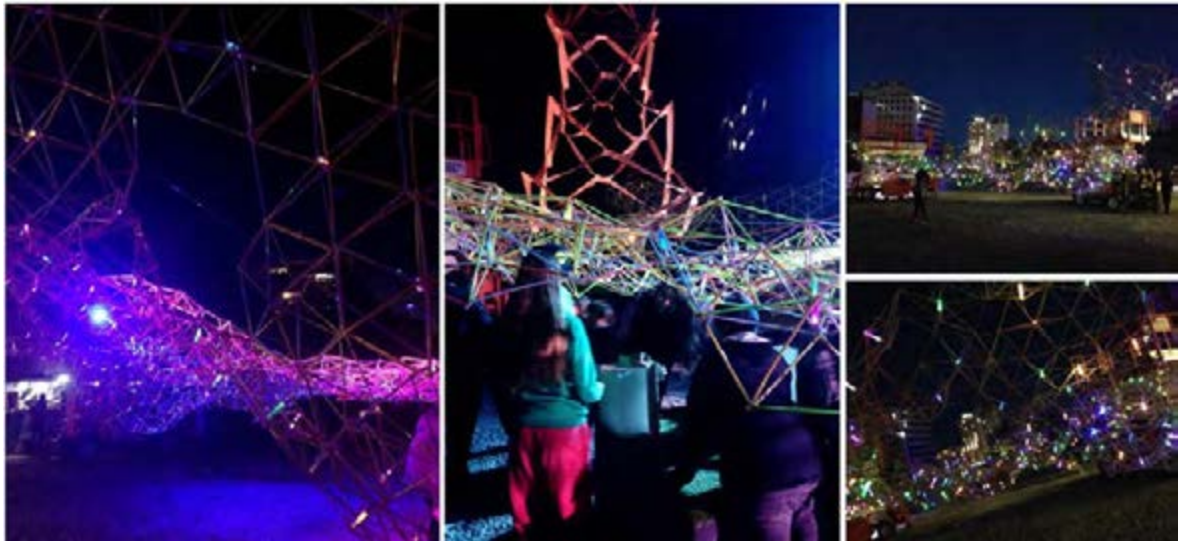
Figure 9 Team Illuminate. Photograph Annabel Pretty plus Unitec Architecture Department – Asylum 2013.

Drawing Design Conclusions
In drawing conclusions from this complex dialectic dialogue, of the notion of ambiguity of "Design" within Architectural Studio, one must be cognisant that:

> *Everything that is absorbed and registered in your mind adds to the collection of ideas stored in the memory: a sort of library that you can consult whenever a problem arises. So, essentially, the more you have seen, experience and absorbed, the more points of reference you will have to help you decide which direction to take: your frame of reference expands.*
> (Lawson p. 156, quoting Hertzberger 1991)[12]

The manifestation and embodiment of the case studies by using these design methodologies via team collaboration and having an outcome that was then variously disseminated to a vast audience (30,000 in 2012 and 10,000 in each of 2013 and 2014) has led these students to describe, interpret and critical analysis their design thinking. Positively demonstrating the feedback loop as illustrated in figure 5 with the application of the design thinking overlaid within an architectural context.

> *Designing is not a linear experience, in which you have an idea, put it down on paper, then carry it out and that's that. Rather it is a circular process: your idea is drawn up, tried, out, reconsidered, and reworked, coming back again and again to the same point.*
> (Brawne p. 78, quoting Piano, 1997, p. 18)[13].

Over the preceding three years of these projects/case studies, one of the defining conclusions that must be drawn is the impactful way in which working in an interdisciplinary and collaborative team, creating a small defined community within themselves, creating connections to other communities of practice, other institutes, public retail partners within the greater community of Christchurch has led to a greater understanding of the design

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[12] Lawson, Bryan. *How Designers Think: The Design Process Demystified*. 4th ed. Amsterdam and London: Elsevier, Architectural Press, 2006: 156.
[13] Brawne, Michael. *Architectural Thought: The Design Process and the Expectant Eye*. Amsterdam and Boston: Elsevier, Architectural Press, 2005.

process, and design research. The various student groups constantly had to frame and re-frame the design problem so as to interpret the process for strategically identifying solutions to their many and varied problems both of *design* and of the *design,* both verb and noun, and tease out the many various notions of design, and its complex ambiguity, within the context of interdisciplinary and collaborative live build projects.

Figure 10. Team Aurora. Photograph Annabel Pretty.

Figure 11. Team Aurora. Photograph Annabel Pretty.

CHAPTER 2 - INTRODUCTION

Encountering the pedagogy of live and interactive architectural projects

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The use of the word "live" as a prefix for a project, is a thought-provoking, and perplexing concept; does one assume that all other projects are dead?
Or is it that "(a)live," in the studio build paradigm, is about the currency and value of the moment? Or is it that one is operating outside of normative architectural academia, and is therefore (a)live?
Untangling the meta meaning of the verb "live" and then juxtaposing it with the word "interactive" could draw the reader to the conclusion that we are talking about a non-momentary or continuous two-way transfer of information – often as not between the student, the lecturing staff and external agencies (in many cases real clients). It is this existence between the borderland of academia and practice that this chapter hopes to unpack and clarify.
In *Architecture Live Projects: Pedagogy into Practice*, Chandler states:

> if we accept vagueness as inevitable then 'live' may simply mean 'engaging with external agencies outside the academy.'[1]

Live studio and interactive build projects often have a complex interwoven relationship and can be somewhat contradictory by nature. They must be real enough for the as yet un-qualified architectural student, while being generally small scale, somewhat self-sufficient in nature, somewhat self-directed, but with enough complexity of real-world learning, plus the potential for live or real clients.
These elements entwined with inter-cultural dynamics of student groups create a fertile

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[1] Alan Chandler, "Building Is Also a Verb", in *Architecture Live Projects: Pedagogy into Practice*, ed. Harriet Harriss and Lynnette Widder (Oxon: Routledge, 2014), 68.

ground for complex issues to be raised about the nature of buildability and practicality and the nature of a practicing architect. These inter-cultural dynamics are often amplified within the architecture schools as, within the globalised New Zealand paradigm of the super-diverse cities, currently more than quarter of New Zealanders are born overseas. This adds complexity to the nature of the student body, and the way in which lecturing staff construct studio live briefs.

Live studio projects can become very close to architectural practice as seen by the Burnham and Wallis paper which covers threshold concepts as framework to analysis – learning by making (LBM), synonymously known as studio live projects. They propose the concept of a "portal" to pass through, to enable the transformative thinking necessary for a student to progress with the translation of an idea into a finished project. Case studies and 20 years of LBM inform the framework. They propose the dual concept of "bounded" – the limiting factors expressed by a brief both internally (within the student or student group) and externally (lecturers and clients) – and the "self-reflexive" learner who needs time to consolidate learning and apply it to their own circumstances.

Conversely, live projects can also sit within the conceptual sphere and be more speculative within their resolution, such as Davis's paper on the triple focus of the tyranny and vagueness associated with the architectural academy, the profession and the market. – a narrative viewpoint of a case study within the University of Auckland. This project moves from the speculative design realms into the formally 1:1 design build project, albeit the project was unable to be realised hence the narrative discussion. The conceptual and speculative are further delved into via Rieger's paper, the multi-sensory augmented liminal space that is bounded by the physical and the digital realms. His positioning statement is that the current situation of virtual reality technology interfaces in a tactile manner, within a case study at University of Auckland. The conclusion redefines one's interactivity between the physical, the sensory and the digital spheres. Manfredini's paper on the public space bounded within the shopping mall, as described by social digital media, sits within the interactivity domain of these themes – specifically, in relation to the interactive nature of Instagram's spatially sourced data, and the hashtag of place tagging within the context of the shopping mall environment within the eight largest malls within the greater Auckland environment.

The diverse manner in which lecturing staff formulate, manage and critique these variously named "live project," "learning by making," "design build," or "workplace integrated learning (WIL)" projects are born out within the case studies included within this chapter, and more specifically with Norrie, Grainger, Elliot, Long, and Woods. They describe a design build within a binary modality of scale and usability constructed with bamboo – the resultant project both a think tank and a large-scale public artwork – defined by University of Tasmania's (UTAS) LBM modality and WIL. Discussion of the case study is in terms of the pedagogy of Christopher Frayling's *Into/For /Through Design* as a framework, all of which adds to the multi-layered understanding of the live project.

These papers cover a vast range of hybrid or amalgam issues, not least: problem solving of materials and construction; exposure to a wide range of people implicated within the greater architectural field; and potential client situations (often being paired with an activation partner). The papers include aligned processes such as fundraising, developing

marketing, running a budget, social media promotion – all of which rarely raise their head within the normal everyday studio typical brief. Lastly but probably most importantly is the ability for students to build 1:1 on a large scale project, moving from the speculative notions within many of the traditional studio briefs to the quite tangible build, i.e., potential architecture. Perhaps the most important issue is this notion of architecture becoming more aligned and centered with materials/craft/making within an (a)live project, something which architecture often has moved away from. It requires the intersection of the idea or notion of the "master craftsman/builder" and the promise of BIM (Building Information Modelling) to return architects to this central role as opposed to sitting on the fringe, as is touched on lightly in Rieger's paper.

In "Educating the 21st Century Architect: Complexity, Innovation, Interdisciplinary Methods and Research in Design," Jenson states, "Architecture programmes must seek to educate innovative individuals within a common ideological framework, constituted by and relating to the needs of their surrounding community."[2]

The interactive component of the equation, of the live studio build, follows many guises both within the dynamics of group work and the interdisciplinary nature of working with many internal and external clients. The student as the potential architect takes the role of the enabler and facilitator who empowers others. It is this axiological collaboration as a positive experience, which is truly the value for the participating student.

In "What Belongs to Architecture, Teaching Construction among Live Projects," Widder states, "The experiences of teamwork and physical labor, and of quickly resolving complex, multivariable problems in a spatial context so that work can proceed, reinforce different ways of understanding architecture than the heroic loneliness of the traditional studio or the temporal disjunction of late-night CAD monkeying."[3]

Measuring the impact of the variously named projects – live, learning by making, design build, workplace integrated learning – is about the currency and value of the triumvirate of student, lecturer, client. Perhaps one can look no further than to considering the fact that speculative projects become (a)live once they have broken free of the confines of the paper/ drawing board / computer and into reality. (A)live is the paradigm of the architect not the lonely or isolated work in the atelier garret, or as Widder states, the "heroic loneliness." (A)live is about reality, and reality provides tangible reasoning for designing, and removes places for the designer to hide, often as not encountered within the speculative large scale architectural project within some studio projects, as generally a student cannot truly create *proof of concept.* (A)live brings objects and people with which to interact, and positions the learning of the student outside of the academic institute and into the community.

This chapter hopefully goes some way towards covering the various theoretical models or leitmotifs with which to measure the impact of live and interactive projects – even though it may not appear truly successful in the eyes of the students until they are far enough away from the project both literally and metaphorically to understand the *"self-*

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[2] Michael K. Jenson, "Educating the 21st Century Architect: Complexity, Innovation, Interdisciplinary Methods and Research in Design", in *Design Studio Pedagogy: Horizons for the Future,* ed. Ashraf M. A. Salama and Nicholas Wilkinson (Gateshead: The Urban International Press, 2007), 48.

[3] Lynnette Widder, "What Belongs to Architecture: Teaching Construction among Live Projects", in Harriss and Widder, *Architecture Live Projects*, 32.

reflexive" modality necessary. Whereas, for the lecturer measuring impact is much more client driven and pragmatic, perhaps less speculative, and of course the client has a wholly different perspective on the resultant architectural intent. (A)live is the artefact as a tangible architectural proposition, and the processes with which to arrive at that point. As Shiel states in *Radical Pedagogies: Architectural Education and the British Tradition,* "They must construct realities, defend the vulnerability of embryonic ideas, and devote valuable time to play, experiment and fail." [4]

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[4] Bob Sheil, "The After Life", in *Radical Pedagogies: Architectural Education and the British Tradition,* ed. Harriet Harriss and Daisy Froud (Newcastle upon Tyne: RIBA Enterprises, 2015), 110.

Design thinking models for architectural education

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Abstract

Technology advancements have profound impact on design thinking in architecture, professional practice and architectural education. New models of representation, along with computational design thinking and innovative approaches in digital fabrication bring new demands for the rethinking of educational pedagogy for the new generation of architects in the digital age. While learning by making has been deeply rooted in the process of architectural education, digital modes of design, representation and manufacturing reconcile the dual nature of design process that has traditionally oscillated between drawing and making, visual and material. In this paper, the relationship between making process in design-led research and other aspects that challenge architectural education are analysed and described. Along with emerging trends in this topic, current design-led research position and strategies at some Australasia schools of architecture are presented.

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1. Introduction

Technology advancements are challenging traditional models of architectural design and education in the age of digital communication. Computational design thinking, along with digital tools for analysis of building performance, geometric optimization of free form structures, novel approaches to digital manufacturing and fabrication, proliferation of new materials, bring higher levels of complexity in the field of architecture, as well as new demands for architectural professional practice. Such demands call for a big rethink of education pedagogy for future architects based on producing "collaborators", rather than "solitary genius" architects (Buchanan 2012), who are able to work in an interactive environment with an array of consultants in multidisciplinary design teams. The need for creation of new and reconstruction of existing pedagogical models in architectural education emerged from new theoretical, computational and cognitive approaches (Oxman 2008). While some authors reconsider the traditional role of model making in architecture fostered with digital fabrication (Stavric et al 2013, Duarte et al 2011), other considered data visualization and architectural representation as a foundation for educational models in architecture (Bermudez and Agutter, 2005).

Model based and representation based design thinking models have been crucial for the development of pedagogical approaches in architectural education. This paper analyses and discusses the evolution of two approaches of design thinking (model based and representation based) and their role in the development of pedagogical models for architectural education in digital age. The relationship between the making process in design-led research and other aspects that challenge architectural education, such as new education paradigms and new digital design environments, are described. Additionally, this paper presents current educational experiments in Architecture Schools of Australasia as a pedagogical framework for educational strategies related to this topic.

2. Evolution of model based design thinking in architecture

Learning by making has been deeply rooted in the live process of architectural design. From "*tektons*", ancient Greek builders, to contemporary "digital master builders", material experimentation and model making have had an important role in the design process. Physical realisation of design concepts has served as a learning platform for testing structural, tangible and visual properties of materials. The most celebrated Renaissance inventions in architectural representation: perspective and simultaneous correspondence between orthographic projections, bring historical disassociation in the design process between visual and material, academic (intellectual) and crafted, imagined and built. However, model making has been proven to have an important role in gaining knowledge, skills and architect's intuition in the design process until today, which can be confirmed by some examples of twentieth-century legacy of architectural innovation through design-led research. In that sense, Antoni Gaudi, Heinz Isler and Frei Otto utilize physical models to explore a parametric, structurally informed design process, which led to highly complex, but elegant solutions in architectural design. Furthermore, wire models of the Chapel at Ronchamp or string models of the Brussels pavilion served to Le Corbusier to explore the relationship between mathematical and physical representation of geometrically rationalized design solutions. In a similar way, modern architects used a model to explore visual and tangible properties of materials. Mies van der Rohe mastered visual and reflective qualities of glass as a material through the process of making a scale model for Friedrichstrasse tower in 1917. Similarly, Peter Zumthor or Herzog & de Meuron used models and full scale prototypes in order to explore tangible properties of materials.

Unfortunately, there are not too many examples of model-making experiments and realizations, pertaining to Learning-by-Making approach in the legacy of modern and contemporary

architecture. The above mentioned examples do not represent common practice in the design-led research process. In most of cases, models are used only as tools for representation. We can find many reasons why design by making was not a common research practice and educational methodology. Compared to the visual representation approach, making models and full scale prototypes is, in most cases, a time consuming, tedious or expensive way to explore complex relations between material, form and structure. Visual tools for geometric representation are also used as a way of communication between an architect and a contractor, which additionally increases the gap between academic research and professional practice.

However, the digital age has not only brought revolution in geometric modelling and representation of space, but also reconciliation of designing and making in architecture. "Digital turn" in architecture brings us the new tools that enable creation of forms that could not have been designed without them, releasing the imagination of architects to unprecedented solutions, but also re-questions awareness towards material properties and making/manufacturing processes (Carpo 2013). Digital manufacturing and increasing advances in material science have radically affected architectural thinking toward *digital tectonics*, (Leach et al. 2004) a new material-based design in which material properties, manufacturing technology and digital design processes are fully integrated.

3. Design thinking through visual representation and new notions of space in digital environments

Being a part of another tradition of architectural thinking, visual imagination has been assisted through various modes of architectural representation. With the advent of digital technologies, notion of space in architecture, which traditionally relied on sensory and existential characteristics, has been developing in new directions. One of the directions deals with geometric properties of space, while another with its social and cognitive aspects.

New geometric concepts of space, different from the three-dimensional Euclidean space, have had an impact on architecture and design thinking in the past two decades (Tepavcevic, 2014). A growing interest toward a non-metric concept of space, such as topological space, has been influenced by development of digital design tools. Recognizing the impact of motion-based modelling tools in CGI software, Greg Lynn was one of the first architects who connected continuous transformations of curvilinear forms with the notion of topology in architecture (Lynn 1993). Topology, a branch of mathematics which deals with those problems that do not depend on the exact shape, can be defined as a study of qualitative properties of certain objects such as convergence, connectedness and continuity which remains unchanged after undergoing a certain kind of transformation. In other words, in digital design process the shape, size or distance are not relevant, but their parametric definition (homeomorphism) and connection between elements. In that sense, virtual environments can provide disjunction from traditional, Cartesian logic of thinking about representation of space in architecture. New digital design tools, along with new digital display devices, from smart phones and tablets to head mounted devices, provide new territory for creating interactive worlds based on fusion of digital and virtual world. Virtual and augmented reality challenges the concept of space providing users with immersive, interactive experience fed by computer generated data.

From the standpoints of social and cognitive science, human activities in the web environment open new directions for new ideas and speculations about space and place in the built environment. Making places that serve diverse human activities was common practice for architects, landscape architects and urban planners for centuries.

Throughout the history, public spaces in built environments have been used as places for meetings, trade and traffic. Public spaces were crucial for the life of cities. However, in

contemporary society, many activities that were traditionally connected to public spaces, such as meeting or shopping, are connected with other types of spaces as well. According to Marc Augé, in our *supermodern* society, which is filled with "overabundance of events", there are many "non-places" with thin and abstract identity" (Augé 1995). Augé recognized spaces of travel, consumption and exchange such as shopping malls, airports, retail outlets, hotel rooms and motorways as common examples of "non-places", spaces which cannot be defined as relational, or historical, or concerned with identity.

According to Canter, place–making can be defined as a conscious process of arranging objects and spaces to create an environment that supports desired activities, while conveying the social and cultural conceptions of the actors and their wider communities (Canter 1977). In that sense, cyberspace, a metaphor of virtual environment for broad range of everyday economic, cultural, and other human activities, is also concerned with the notion of place and space. Those new "digital places" in virtual environments are deprived of identity based on *genius loci*, but they are linked with users' activities and their connections. Moreover, analyses of human activities within web environments and their relation with real physical spaces can provide invaluable information about condition of public spaces and places with abstract identities (non-places) in the digital age.

4. Pedagogical models for digital design thinking in architecture

According to Dewey, there are two sources of knowledge for an individual: one is goal directed and the other acquired from student interaction with the environment (Dewey 1938). Both sources represent a framework for a maker-centered education. Making scale models and prototypes, which is crucial for Learning-by-Making (LBM) approach, is connected with experiential learning and is based on Jean Piaget's epistemological theory of constructivism (Cakir 2008). In this sense, the learning process in architectural design is the most efficient through hands-on material engagement. While seeking new models for the architectural education which is exposed to extreme complexity of aesthetical, ethical, technical, economical, functional challenges, maker-centered education tries to connect the processes of design and construction. As an educational model, LMB has been deeply rooted in the history of architecture, but it has always been in the process of adjustment to new cultural and technological demands. Throughout the centuries, learning architectural skills has been tightly connected with hands-on material and construction experimentation. During the renaissance, paper-based design thinking (PDT) has been developed and became important part of the design process. In the XX century, the most prominent pedagogical models in architecture were based on the principles of the Bauhaus "Vorkurs". They were essential for the elementary study of form and material, largely based on workshop activities with hands-on activity of doing and making. With the advent of digital technologies and tools, the need for the development of novel LMB approaches emerged. Continuation and development of LMB and PDT in the digital age can be analysed through new educational theories, educational models (live projects), and educational techniques. Some successful examples of utilization of new educational models and theories from the Australasia school of architecture are further analysed within this section.

4.1 Analysing learning outcomes from the LMB approach in architecture

"Learning" architectural design is a complex process in which students experience transformation of their understanding of the process of design. Threshold concept is a relatively new theoretical framework for teaching based on overcoming student's learning barriers by understanding the following dimensions of learning: transformative, bounded, integrative, discursive and troublesome. It involves integrating or synthesising knowledge that was previously viewed as unrelated (Meyer and Land, 2006). Threshold concepts bind a subject together, being

fundamental to ways of thinking and practising in a discipline. It can be applied to any discipline in higher education, but it is of particular importance for education in architecture where aesthetic, tactile experience is crucial, and creative practice is a way of thinking and a way of understanding (Hokstad et al 2016). In order to analyse educational outcomes from the learning experience of LMB studio at the School of Architecture & Design, University of Tasmania, Richard Burnham and Louise Wallis used educational theory called threshold concepts (Meyer and Land, 2006). They have been analysed at the LMB studios in 2013 and 2014 in relation to the most common characteristics attributed to threshold concepts. As a result, Burnham and Wallis identified that the learning experience of an LBM studio is closely aligned with the transformative, bounded, integrative, discursive and troublesome characteristics of a Threshold concept.

4.2. LMB approach to the non-standard building forms

One of the most important issues for the design of non-standard building forms is efficient and feasible realisation. While complex forms can be easily created in digital environment, fabrication and manufacturing might be a challenge and they require a structurally informed and fabrication-aware design process. For that reason, deep understanding of material behaviour and structural properties, along with collaborative design environment and interdisciplinary overlap are crucial for the design process and expansion of design knowledge.

Digital fabrication strategies and learning-by-making approach provide interesting possibilities and new territories for the research in architecture, as well as design pedagogy. Understanding of formal qualities and structural properties of the material are central to the live design-led research and construction of a bamboo pavilion for the Dark Mofo annual arts festival in Hobart, Tasmania. This experimental project was developed through collaboration between the School of Architecture & Design at the University of Tasmania and Sydney-based architectural practice Cave Urban. Direct engagement of students in the process of design and practice was done in a collaborative environment that included bamboo-engineering specialists, practicing artists and event designers. Experimentation with full scale prototypes and scale models in the design process, which is crucial for Learning-by-Making (LBM) stream at the University of Tasmania's architecture curriculum, is used to explore formal qualities and structural behaviour of non-conventional materials and construction processes. Through the development of prototypes for formal testing of design ideas and construction, the understanding of structural performance and material properties is also provided. In that sense, LMB approach can be observed not only as a design methodology shown in the experimental bamboo pavilion project, but also educational and pedagogical methodology in architecture, as suggested by Burnham and Wallis.

4.3 Live projects- practice based LMB approach

Dissociation between architects and other parties in the building process started in late renaissance and culminated in the mid nineteenth century with the advent of "contract" documents (Kolarevic 2005). It also affected architectural education system, creating the discrepancy between architectural academy, professional practice and market. Consequently, live projects emerged as a new pedagogical form, based on LMB approach bringing closer the academy, profession, market and society. Such discrepancy between architectural academy, the profession and the market is in the main focus of the research about "live project" within the design studio at the School of Architecture and Planning, University of Auckland, conducted by Michael Davis. Building contractors and developers are often reluctant to take part in speculative and experimental projects with complex forms, found in design studios in many architecture schools worldwide. Moreover, academy is often seen as being cut off from reality and pragmatic engagements regarding the economic and social demands. The aim of the live project is closer

connection between academy and the profession, through engagement of market conditions. According to Davis, bringing together community groups, businesses and developers to live design studio projects, along with collaborative process, may result in negotiated, speculative-yet-realisable projects. Introducing live projects in architectural education brings new opportunities to engage a diverse range of stakeholders, as well as consultants and experts, in a creative learning process through collaborative team work. At the same time, live projects recall maker-centered learning in architecture.

4.4 Pedagogical models for the emerging digital design environments
Along with Learning-by-making, paper-based design thinking is essential for the process of learning and thinking in design. Characterization of paper-based design thinking as a foundation of design education became broadly accepted (Schön and Wiggins 1988, Oxman 2008) and introduction of CAD (computer-aided design) did not bring revolution in the process of design thinking. While CAD has been basically considered as a tool for imitating paper-based design, DAD (digital-architectural design) brings novel concepts of digital design models (Kalay 2004), new design thinking (Oxman 2017) and new notions of space (Tepavčević 2014), replacing the paper based media approach.
In other words, digital design environment brings not only new design tools, but also a new way of design thinking and notion of space. In that way, digital environment opens up the question of designing spaces in architecture characterized by the duality of physical and digital worlds. For Uwe Rieger and The Lab for Digital Spatial Operations [**arc/sec**] at the University of Auckland, the main research question is about user interaction with haptic-digital spaces and the possibilities for construction and design of buildings in which digital information can be given a physical form and physical and spatial appearance. Design process focused on user interaction provides new territories for research in which the boundaries between physical and digital world are blurred.
At the same time, digital environment opens up the question of design representation. New modes of design representation emerged from digital media, enabling visualisation of different kinds of data. Data visualization became extremely important for GIS and geospatial representation in urban planning. This can be exemplified by the study conducted by Manfredini, Jenner and Litterick at the University of Auckland. The social network platform Instagram, which provides geospatial information and visual representation of space, is used in their research to analyse spatial qualities of shopping malls in Auckland in order to show a strong relationship between spatial identity and number of images that represent that space. This research gives valuable contribution to the research of places of with abstract identities (non-places) and how are they perceived by users. Such researches are of particular importance for designing public spaces and improving conditions of public life.

5. Conclusion
Models of design thinking in architecture have traditionally oscillated between drawing and making, visual and material. Advanced design and manufacturing technologies, along with digital modes of representation, did not only bring design thinking models, but also reconciled the dual nature of the design process. Furthermore, rethinking of models for design-led research provides a new framework for design pedagogy that responds to technological shifts and new design thinking. The experience of engagement within the framework of live projects offers new educational trajectories that lean on collaborative research setting and maker-centered learning processes in architecture.

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Learning by Making. Long-term collaborations and socially productive outcomes

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Abstract

The Learning-by-Making (LBM) program at the University of Tasmania has 20 years experience in collaborative, community-based "live" studios. Academics involved in the program have intuitively understood that a learning environment integrated with the public realm, and based in a constructed reality affords students an immersive understanding of the design process. More recently the program has shifted its focus from stand-alone, client-responsive projects to a long-term, design-led research agenda. Individual projects - including micro-dwellings, scout huts, an exhibition stand and a mobile playground - are seen as steps in the evolution of an innovative building system that harnesses the creative and socially productive potentials of digital fabrication. The benefits of this shift for academics and clients are clear. For academics, research and teaching activities can be mutually supportive, while clients benefit from a design/fabricate/assemble process that has been tested, analysed, applied and incrementally improved. The primary focus of this paper will however attempt to identify the educational impact on participating students, and will do so using the analytical lens of a relevant educational theory called threshold concepts[1]. The theory suggests that students can overcome barriers to learning when specific criteria or "dimensions" are present.
The results of this analysis indicate that in this environment learning can be *transformative*, resulting in irreversible conceptual links between design idea, fabrication and practice. The conceptual space of the project is *bounded* by the research objective, budget, technology and client requirements, and *integrative* in that they inevitably involve decisions on materials, structures, habitation patterns and climate control. The learning is *discursive* as students are required to articulate their opinions on design decisions, both within the student group and with community collaborators. The primary data sources for this investigation have been students' reflective journals, combined with teacher observations.

Keywords: digital fabrication, design-build, live projects, experiential learning, architectural education.

Design is a troublesome concept to teach. It is varied, complex, difficult to capture in cognitive dimensions[1] and is not readily learnt through reading or instruction. Design represents a devised solution to what is often an ill-defined problem and requires students to hold the domains of idea and construction simultaneously, in a dynamic balance. Learning-by-making (LBM) studios, inspired by experiential learning,[2] provide an environment where students are encouraged to strengthen conceptual links between idea and fabrication, and to take collective responsibility for designing, prototyping and realising a "live" design project. The 120 completed projects include stage sets, exhibition stands, bus stops and bush installations. The experience is experimental in nature, providing impartial and tangible feedback to students. Students are exposed to reality, as opposed to a representation of reality, and they cannot indefinitely resist the integration of construction into a design response. There is no space for "bluffing gravity." LBM has become an invaluable asset to the school in terms of community engagement and is a highly visible manifestation of the school's professional and educational values.

Recently the program has expanded its focus from stand-alone, client-responsive projects to a long-term, design-led research agenda based on long-term collaborations with community partners. Individual projects are seen as steps in the evolution of an innovative building system that harnesses the creative and socially productive potentials of digital fabrication. The research hypothesis proposes that digital fabrication can strengthen the conceptual and physical links between design and construction, and that the precision and reliability of digital fabrication can be harnessed for socially productive outcomes. The products prototyped by LBM studios over the past six years - including furniture, a teardrop camper, a skate ramp, micro-dwellings and a scout hut (see figure 1) - are assembled by unemployed youth in a formal construction-training environment run by Youth Futures Inc. (YFI), a registered training organisation. LBM students prototype the designs (with close collaboration from YFI) and the "kit of parts" is handed over for serial manufacture. The process is driven by a customised plugin to SketchUp, called "SuperSlob," developed by the school to a brief of accessibility, transparency, reliability and predictability. The process facilitates three-dimensional arrangements of sheet-based CNC-cut components (primarily plywood) connected with a limited suite of jointing patterns, and assembled with a limited toolset of rubber mallet and screws.[3]

The benefits for academics of this shift is that research and teaching activities can be mutually supportive, while clients benefit from a design/fabricate/assemble process that has been tested, analysed, applied and incrementally improved. For example The Castle - an extendable micro-dwelling intended for youth at risk of homelessness - has undergone several iterations before Housing Tasmania commissioned YFI and the school to design and deliver 8 Castles to their own requirements. While it has been possible to form a generalised opinion as to the educational benefits of this evolved research-based LBM

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[1] Bryan Lawson, *How Designers Think: The Design Process Demystified*, 3rd ed. (Oxford: Elsevier/Architectural, 1997), 305.

[2] David Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (Englewood Cliffs, NJ: Prentice Hall, 1984).

[3] Ryan Tubby, Richard Burnham, and Robin Green, "SuperSlob: The Development of a Parametric Component Jointing Regime For Standard Sheet Materials," *Building on Knowledge, Theory and Practice: Proceedings of the 46th Annual Conference of the Architectural Science Association*, ed. Henry Skates (Southport, Queensland: Griffith University, 2012), 1-2.

model, it is the purpose of this paper to begin a more objective evaluation of its transformative potential for students.

Figure 1. A selection of projects from the LBM digital fabrication research activity (left to right): The Castle2 in backyard setting; The Castle5 – unfolding; Scout-hut prototype).

Methodology

Literature related to "live" design-build studios is often criticised for inadequate rigour and a lack of connection to existing educational theory, instead focusing on the built outcome and a general impression of student satisfaction. This pattern, observed more broadly within architectural education, has caused a few to speculate whether those involved in the "doing" are more adept and motivated by practice and tacit knowledge rather than its relationship to learning theories.[4][5][6]

Threshold concepts[7] was chosen as an appropriate framework to evaluate learning as it provides a way for educators to identify barriers in student understanding and subsequently develop methods to overcome them[8][9] (the framework also provides an alternative to documenting the teaching approach, which has been explored in previous LBM articles[10][11]

[4] Bob Fowles, "Design-Build Projects in Architectural Education," *Design Studies* 5, n. 1 (1984): 7-14; Helena Webster, "Facilitating Critically Reflective Learning: Excavating the Role of the Design Tutor in Architectural Education," *Art, Design & Communication in Higher Education* 2, n. 3 (2004): 101-111; Lawson, *How Designers Think,* 307.

[5] Helena Webster, "Facilitating critically reflective learning: excavating the role of the design tutor in architectural education." Art, Design & Communication in Higher Education, 2 (2004): 101-111.

[6] Bryan Lawson, *How designers think: the design process demystified*: 307.

[7] Meyer and Land, "Threshold Concepts," 3-18.

[8] Glynis Cousin, "An Introduction to Threshold Concepts," *Planet 17* (December, 2006), accessed October 6, 2014, http://www.gees.ac.uk/planet/p17/gc.pdf; Jos Boys, "Learning Spaces From an Educationalist Perspective," in *Towards Creative Learning Spaces: Re-thinking Architecture of Post-Compulsory Education,* ed. Jos Boys (London: Routledge, 2011), 37-50.

[9] Jos Boys, "Learning spaces from an educationalist perspective," in *Towards Creative Learning Spaces: Re-thinking Architecture of Post-Compulsory Education*, ed. J. Boys (London: Routledge, 2011), 37-50.

[10] Richard Burnham and Louise Wallis, "The Castle: A Long-term Community Partnership," in *Live Projects Designing with People,* ed. Melanie Dodd, Fiona Harrisson, and Esther Charlesworth (Melbourne: RMIT University Press, 2012), 186-191; Richard Burnham, Louise Wallis, Ian Clayton, and Robin Green, "University of Tasmania: The Castle," in *Design Build Studio,* ed. William Carpenter (Decatur, Georgia: Lightroom, 2011), 381-39; Louise Wallis, "Building the Studio Environment," in *Design Studio Pedagogy: Horizons for the Future,* ed. Ashraf M. Salama and Nicholas Wilkinson (Gateshead: Urban International Press, 2007), 201- 218.

[11] Richard Burnham et al. "University of Tasmania: The Castle," in *Design Build Studio*, ed. William Carpenter (Decatur, Georgia: Lightroom, 2011), 381-39.

[12]). A threshold concept is understood to be a concept with which students may become stuck and experience difficulties until, "a new and previously inaccessible way of thinking about something" is achieved.[13] A threshold concept represents a "portal" that students need to travel through in order to transform their thinking and enable progress in further studies. The characteristics of the research-based LBM studios will be analysed in relation to the most common characteristics attributed to threshold concepts: *transformative, integrative, bounded, discursive and troublesome.*[14]

The primary source of data comes from the design reports that LBM students are required to submit, critically reflecting on the learning outcomes; communication; collaboration; making and speculation. The design reports (selected from seven LBM studios between 2013 and 2015[15]) provide evidence as to whether students are making conceptual links between design, fabrication, assembly and practice. We have also drawn on the authors' observations from LBM studios, as well as stakeholders' observations.[16]

Transformative

The *transformative* characteristic of a threshold concept reflects the change that occurs when a student understands a new way of thinking and/or practicing the discipline subject matter.[17] The fundamental shift in understanding occurs when an idea is translated into reality. LBM studios highlight the links between idea and the implications for its subsequent fabrication, including the properties of materials, connections, component specification, fabrication processes, tooling and the patterns of habitation. Students are encouraged to use physical models instead of drawings, reinforcing skills in three-dimensional thinking and reducing the abstraction that can occur between paper-based design and object. SketchUp software was selected because object making on this platform is conceptually transparent, accessible and SketchUp can support every step of the process: conceptual design, detailed resolution, CNC file preparation, documentation and animated assembly instructions. Seeing the image on the screen become a physical reality and seeing the stack of plywood become a habitable structure are a magical transformations that should never be underestimated.

> *The fact that every single detail of this small object had to be resolved reveals the delusion of the oversimplified design processes in other studio assignments. We understood that the other half of the project is to see how it can be pushed to 1:1 scale with real material.* (Third year student B, 2013)

[12] Louise Wallis, "Building the Studio Environment," in *Design Studio Pedagogy: Horizons for the Future*, ed. Ashraf M. Salama and Nicholas Wilkinson (Gateshead: Urban International Press, 2007), 201- 218.
[13] Erik Meyer and Ray Land, "Threshold Concepts,", 2006: 3.
[14] Ibid, 7-8.
[15] University of Tasmania, Ethics Reference Number: H0014468.
[16] John Creswell and Vicki Plano Clark, *Designing and Conducting Mixed Methods Research* (Los Angeles: Sage, 2011).
[17] Erik Meyer and Ray Land, "Threshold Concepts," 7.

Figure 2. Left to right: Outdoor Learning Space assembly; collaboration with Youth Futures trainees; Design-Made-Trade Exhibition Stand.

We believe that transformations in learning may be more powerful and enduring if they are achieved collaboratively or through students taking a role of responsibility. The structure of an LBM studio actively encourages collaborative decision-making, initially in rapid cycles of model making in small groups, followed by the coalescing of ideas with the studio as a whole. The student group is slowly given the opportunity to take responsibility for the design evolution, goal setting and ultimately the delivery of the project.

> *I believe that my skills in team leadership increased dramatically through having to sometimes take charge to get a task completed* (Third year student C, 2013).

Working alongside clients and their representative - including homeless youth, school students, work-experience trainees, school students and teachers - design students are exposed to a diversity of world-views, providing enriching and sometimes confronting experiences. Emotional engagement with a design project that has a socially productive outcome may reinforce the learning. Students involved in The Castle (2008-) have regular contact with YFI trainees and supervisors who provide feedback on proposed assembly procedures and detailing. The pop-up Skate ramp (2016) involved discussions with professional skaters and graffiti artists. Samuel Mockbee, the Director of Rural Studio suggests: "What we should do is go into their world and understand it. They go out there with pre-conceived ideas, only to discover that they gonna learn something from these people."[18]

Land and Meyer[19] suggest that the transformative characteristic of a threshold concept is related to whether the learning is *irreversible*, enduring and difficult to "unlearn." The core knowledge needs to remain intact and the student unlikely to return to previous modes of thinking. Students regularly refer to the learning that comes as a consequence of making a mistake and the subsequent redefining of a problem or solution. For example one student titled their Design Report, "10 Lessons Learnt by Making Decisions and Mistakes as a Group" (Third year student F, 2014). Learning from mistakes may be one of the most effective types of feedback that a student can receive.

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[18] *Citizen Architect: Samuel Mockbee & the Spirit of the Rural Studio,* directed by Sam Wainwright Douglas (Big Beard Films, 2010), accessed August 10, 2014, http://citizenarchitectfilm.com/.
[19] Meyer and Land, "Threshold Concepts," 7.

> *An important attitude that I personally still need to improve is instead of being afraid of errors, I should look for errors, embrace their existence and tackle them.* (Second year student H, 2015).

Integrative

Threshold concepts may also involve integrating or synthesising knowledge that was previously viewed to be unrelated.[20] In contrast with reductive design curriculums where design, building technology, theory and professional conduct are taught separately, LBM students are exposed to many interrelated activities that comprise design practice; including researching and specifying appliances and components, consulting with clients and suppliers and considering the implications of assembly sequencing. As well as mimicking the realities of design practice there are often opportunities for component stress testing (supervised by an engineer) to be integrated into the evolution of the design.

Figure 3. Left to right: Wall panel stress testing; Scout hut prototyping; Collaborative design environment.

The Castle (2008-) and the Teardrop Caravan (2014-) require an integrated consideration of all aspects of a habitable environment: servicing, structure, openings, privacy as well as notions of home and identity. The Playbox (2014), commissioned by the Tasmanian Catholic Education Office, is based around an educational theory called "Loose Parts,"[21] and required integration of Australian Standards for small trailer design, storage of an optimum mix of found objects and use as a small playground (see figure 8).

Figure 4. Design Made Trade Exhibition stand. Left to right: multi-media design; assembly; installation.

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[20] Ibid.
[21] Simon Nicholson, "How Not to Cheat Children: The Theory of Loose Parts", *Landscape Architecture* 62 (1971).

The student groups are required to synthesise their ideas into a single buildable outcome. Ownership by the whole studio is seen as being important in maintaining collaborative energy, responsibility and teamwork. As stated, ideas are gradually coalesced, edited, integrated and distilled until a single digital or physical model embodies the aspirations of the studio.

> *When I look at the finished object I can see that my idea had been included, but in a way I hadn't thought of.* (Second year student E, 2013).

One effective and active model for design collaboration centres around a projected image of the digital model. One student is responsible for manipulating, adding to and amending the model, based on the suggestions of the rest of the group. Collaboration between master's and undergraduate students is also encouraged, in a context where undergraduate students apply and test research knowledge provided by master's students.

Bounded

The *bounded*[22] characteristic of threshold concept refers to the setting of appropriate parameters for a given project. The "external boundaries" of an LBM project - brief and budget - and the "internal boundaries" – research, technology and project timeframe - serve a limiting purpose and create an appropriate conceptual space for the learning to occur.

The extended timeframe and multiple project experience of the current LBM research-led regime have allowed the parameters of the SuperSlob digital fabrication process and the associated construction system to slowly evolve into a defined and refined process. The basic boundaries of the system are clear to the students: Sketch-up SuperSlob, 12mm plywood, CNC cutting, mallet and screws. Preferred settings for materials, tooling and assembly (tolerance between components, span tables and screw profile) have all been established through trial and error. Even the use of a rubber mallet has generated some guidelines associated with choice of mallet weight, the order and direction of use and the need to listen and respond to the tone of the impact. A more general and enduring design aspiration is that every component should be "useful" to the inhabitants, either in terms of enclosing space or as furniture (i.e., eliminating components whose sole role is structural). Having established these basic but critical settings, subsequent students have increased opportunities for creating new knowledge, including current investigations into thermal performance, efficient "nesting" of components on plywood sheets, "kerfing" (using perforation and scoring patterns to achieve bending) and animated assembly instructions. The limited toolset allows all students to participate on equal terms, whereas many traditional skills are problematic for those who have not had prior exposure. The boundaries necessary to pursue a research agenda may however appear excessively restrictive to students who believe that there are other ways of fulfilling the project brief (e.g., "why can't we use studs rather than sheets?").

Several projects, most notably The Castle, have involved multiple iterations of the same brief - mobile, autonomous crisis accommodation for a single young person - which has

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[22] Meyer and Land, "Threshold Concepts," 8.

resulted in students being able to make an evidence-based judgement on, for example, how much headroom is required for sitting, reading in a sleeping loft, or the ideal layout for a compact kitchen.

The bounded characteristic assists students to familiarise themselves with the boundaries of the discipline and practice. Students are encouraged to initiate communication with local authorities and to ensure compliance with planning and building regulations, structural adequacy and standards.

> *After extending our knowledge on the specifications and regulations we had a more informed and realistic approach that we hope affected the design process for the better.* (First year domestic student F, 2013).

In all LBM studios students are exposed to varying degrees of risk and are expected to become responsible for risk management (including appropriate documentation). According to Harriss[23] exposure to and management of risk can be an important dimension of learning.

Figure 5. Left to right: animated assembly instructions; digital and manual tools; the Superslob toolset.

Discursive

Land and Meyer[24] make reference to the role that extending discipline language can play in mastering a threshold concept. Appropriate and effective communication is explicitly encouraged within the LBM studio, both within the student group and with clients and community partners. Design preferences can be passionately argued within the student group but opinions must be respectful and justified using discipline language (e.g., "firmness, commodity and delight") or documented evidence (e.g., sketch, model, manufacturers specification). Students' written reflections often focus on the dynamics within the studio, commenting that irrational or defensive "ownership" of relevant information or ideas had the most destructive impact on project progress.

> *… students were guided rather than directed, leaving the responsibility up to us, simulating a real-world studio environment. At times this was an exasperating experience, when stubborn personalities cling to irrational ideologies that restrict*

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[23] Harriet Harriss, ed., *Architecture Live Projects: Oxford School of Architecture 2010-2012* (Oxford: Oxford Brookes University, 2012).
[24] Meyer and Land, "Threshold Concepts," 14.

progress. However, as the semester progressed it became apparent to me that rather than the physical model, managing group politics was the most valuable learning outcome. (Third year domestic student M, 2014)

We were inevitably headed for a crash at some point. But when it came, it actually clarified things. It was such a relief to finally hear the real reasons behind some of these ideas and critique them honestly. Sure there were nearly some deaths, but the afterglow was certainly worth it. (Third year domestic student Y, 2014)

There are certain discursive characteristics that emerge when students and long-term clients are invested in the intricacies of a particular way of doing things. Over the years the SuperSlob system has evolved a language of its own, where terminology is shared and owned by the participants in the project. The terms "slobbing" (a portmanteau of "slot" and "tab"), "mouse-ear" (the radius applied to an internal corner) and "mallet whispering" (reflective skill of using the rubber mallet) become common usage.

Figure 6. Left to right: Pop-up skate-ramp; identifying 'missing mouse-ear'; design workshop with primary school students.

Listening and observing are stressed as primary skills for designers and students are encouraged to be conscious of the verbal, spatial or graphic vocabularies their community collaborators use.

The most notable difference when comparing differences between architecture and primary school students was the choice of words when describing elements in design. The Trevallyn students were able to effectively and clearly articulate their design ideas and concepts to other primary school students and to us architecture students. (Third year domestic student C, 2013)

Physical models are promoted as the primary communication medium from concept to construction and are particularly effective because participants can gather and talk across and around the model.

The models were a great way to interact with the children, and were very successful in deriving design ideas made by the children (Third year domestic student H, 2013).

Models are capable of either a positive ambiguity or an explicit accuracy. Students are encouraged to mark-up and manually edit laser-cut models in order to discourage the perception of precision, perfection and resolution.

Figure 7. Left to right: Outdoor Learning Space model; Playbox model; CastleX model.

Troublesome

Troublesome knowledge[25] is characterised as being difficult to understand. Design, due to its inherent tacit and cultural characteristics, challenges many students, [26] and for some the experience of an LBM studio does not alleviate their "stuckness." These students may fully participate in the studio and report a positive experience but their fundamental understanding of the design process does not appear to shift. They are unable to apply the new knowledge in subsequent studies. We observe this phenomenon in some first-year building technology students who, despite building a small timber frame shed are unable to translate that direct knowledge to documenting a timber frame building the following semester. The difficulty experienced by students to transform troublesome knowledge is well documented in threshold concept literature, after a decade of testing and debate.[27] It is possible that for some "self-reflexive" learners the transformation may take time or may require consolidation. A student reflects:

> At least I realise now that I enjoyed the process and learnt more than I realised at that point in time. (Third year student D, 2014).

Earlier research has shown that master's students found LBM studios valuable as undergraduates because it helped contextualise knowledge gained later in the course,[28] but found it difficult to reconcile with more complex briefs or when timber construction is no longer used.[29] Samuel Mockbee believes that a "delayed response" is common for many

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[25] David Perkins, "Constructivism and Troublesome Knowledge," in Meyer and Land, 33-47.
[26] Ibid.
[27] Ray Land, "Toil and Trouble," in *Threshold Concepts in Practice*, ed. Ray Land, Jan Meyer, and Michael Flanagan (Rotterdam: Sense Publishers, 2016), 11-24.
[28] Louise Wallis, "Learning-by-Making: Design-Build Studios at the School of Architecture at the University of Tasmania" (master's thesis, University of Tasmania, 2005), 143.
[29] Ibid, 143.

Rural Studio participants, that they only understand the significance of their experience many years later.[30]

The collaborative nature of the studios can enhance learning for some but if a student's identity within the studio group is fragile then collaboration can be troublesome; their roles and their relationships with other students may be problematic, uncomfortable or even traumatic.[31] If their position in the group is put under scrutiny, either by themselves or by others, students will find other aspects of studio content - questions of practicality, creativity, and interpretation of client requirements – much more challenging. The way of finding some confidence is a recent development in threshold concepts theory.[32]

It would not be particularly surprising that knowledge gained from direct experience with a non-standard construction system such as SuperSlob is not readily applicable by students in later studies, but perhaps there are other attributes of a research-led "live" studio that can impact on "stuckness." Firstly, emotional engagement with a socially productive endeavour and being able to see that the research activities already have meaningful "runs on the board" may contribute to an atmosphere more conducive to learning. Secondly, when students know that they are contributing to a bigger picture, by for example, providing feedback on improvements to the performance of the software or developing animation techniques to communicate assembly procedures, the learning becomes two-way.

Conclusions

Despite difficulties in evaluating precise educational outcomes of the LBM studios the analytical lens of threshold concept has identified several attributes of the program that appear helpful in supporting students' understanding of design. Through analysis of students' reflections we believe that the most powerful transformative characteristics are as follows:

- the impact of translating idea into reality;
- having space to make mistakes and learn from them;
- being emotionally engaged with the people and the project;
- being exposed to differing world-views removed from the self-affirming environment of the design studio;
- taking collective responsibility for decisions and their outcomes;
- the integration of different types of design information ;
- awareness and enhancement of design media and discipline language.

It is important to remember that individual students in a given LBM studio appear to have been impacted by different aspects of the project, whether it might be the frustrations of group decision-making processes or the opportunity to explore the detailed design and fabrication of an operable round window.

The *bounded*, *discursive* and *integrated* dimensions of threshold concept have been helpful for studio coordinators in considering the scope and structure of an LBM studio. While there is a role for open-ended and speculative LBM studios the boundaries created by an on-going research agenda and long-term client relationships are generally helpful in

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[30]"Citizen Architect."

[31] Glynis Cousin, "Threshold Concepts, Troublesome Knowledge and Emotional Capital: An Exploration into Learning About Others," in Meyer and Land, 134-147.

[32] Peter Felton, "On the Threshold with Students," in Land, Meyer, and Flanagan, 6.

focussing student energy. Further understanding of how the *bounded* dimension influences learning outcomes may suggest that undergraduate LBM projects should be more tightly bounded, whereas master's LBM studios might involve more open-ended and speculative research. Despite the growing bank of knowledge in the SuperSlob system, new areas of experimentation and research regularly emerge e.g., "kerfing" where perforation and scoring patterns add "bending" to what is an intrinsically orthogonal construction system. The analysis of the design reports identifies that for some students overcoming "stuckness" may need more time and more reinforcing experiences. If we pursue this line of enquiry we need to improve the quality and quantity of the data, meaning that we can more effectively and more accurately gauge the transformative impact of the LBM studio on students. The design report is a useful starting point but it could be more effectively targeted, requiring that students make more explicit reference to the ways that they have acquired, applied and retained new knowledge. The structure of the design report could be tailored to address our current knowledge gaps. Future research will map trends occurring within cohorts and will place a greater focus on practices to overcome recognised learning barriers and to support students in making their learning more visible.

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Academy-profession-market.
Problematising tensions in the live project

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Abstract

This paper examines a form of "live project" that casts the design studio topic in three distinct roles. In one guise it is a collaborative, "real world," engagement with a range of stakeholders. In another it presses toward the production of buildings, while in a third, it acts as the vehicle for higher level academic design research. Within the design studio at the University of Auckland, School of Architecture and Planning these three imperatives are juxtaposed to define the contested territory from which the architectural project emerges as negotiated, speculative-yet-realisable outcome.

The aim of this discussion is to demonstrate the triple focus model of live project and the problem currently confronting it: a local instance of a complex, widespread problem between the architectural academy, the profession and the market.

Since 2007 a succession of community groups, businesses and developers have brought their projects to the design studio at the school. Typically they have come looking for speculation as to the potential of their projects, the kind of breadth of exploration that generally is not viable within commercial architectural organisations. Meanwhile, through these projects, students are asked to conduct research into the development of their own critical, architectural making practices.

The text begins with an account of one particular project – a speculation as to the development opportunities of heritage buildings on "earthquake prone" sites in Auckland for one of the country's most progressive developers. It looks at the larger academic, professional and market conditions being responded to and thus situates this type of live project before concluding with an outline of potentials for its advancement. In so doing it signals work to come.

Keywords: architectural pedagogy, live project, design research, practice.

THE JOURNAL OF PUBLIC SPACE

Introduction

This paper reflects upon a form of "live project" that casts the design studio topic in three distinct roles. In one guise it is a collaborative, "real world," engagement with a range of stakeholders. In another it presses toward the production of buildings, while in a third, it acts as the vehicle for higher level academic design research. Within the design studio at the University of Auckland, School of Architecture and Planning, these three imperatives are juxtaposed to define the contested territory from which the architectural project emerges as negotiated, speculative-yet-realisable outcome.

Architectural design pedagogy is the focus here. The paper aims to present a "triple focus" model of live project and to set out the problem evidently currently confronting it: a local instance of a complex, widespread problem between the architectural academy, the profession and the market.[1] The hope in doing so is that the problem might be addressed in future projects. The text is narrative in manner and begins with an account of one particular project. It pulls back to examine the experience in relation to broader conditions and thus situates this type of live project. It concludes with an outline of potentials for its advancement and in so doing signals work to come.

The teaching model discussed is termed "live" because the projects have real clients, with real briefs, sites and deadlines. Sometimes they also have real money that brings with it the opportunity to realise projects in built form.

The live project at the University of Auckland

The University of Auckland's School of Architecture and Planning, offers a three year undergraduate Bachelor of Architectural Studies (BAS) followed by a professionally accredited, two year Master of Architecture Professional (MArch Prof). The studio-based design courses lie at the heart of our programmes. Different types of live project are framed and run as design courses as circumstances and opportunities permit at years 2 and 3 of the BAS and year 1 of the MArch(Prof).

Each year since 2007 we have run at least one that has focused on the potential procurement of a building. Clients have ranged from community groups, to government agencies, to small businesses, to developers. We aim to bring students into contact with these bodies and thus to foster relationships between the academy and what might be termed the "market." The purpose of doing so is not to overwhelm the students' ambitions, and not to make them "compliant" architects, but rather to normalise the tension between the development of their own practice and "real world" constraints. It also offers the rare chance for students to impact the built environment while still in formal education.

The work we provide our clients with builds impetus behind their projects and operates as a base for funding applications, community consultation and provocation for governing boards. To name the projects to date: Muriwai Surf Life Saving Club (2007), see figure 1; Housing (4) New Zealand (2008); EcoTech (2009); Confucius Institute (2010); Kaipatiki Project (2011); College Rifles Rugby Club (2012); Akarana Golf Club (2013); Fletcher Developments (semester 1, 2014). In the second semester of 2014 we ran a project for a developer who will be referred to here as the "Client."

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[1] This paper develops from an earlier text. See Michael Davis, "Academy-Profession-Market: Confronting the Tension Through the Live Project" in *Applied Collaborations*, *Proceedings from the 8th International Conference and Exhibition of the Association of Architecture Schools of Australasia* (Christchurch, New Zealand, 2015).

Figure 1. Muriwai Surf Lifesaving Club, http://www.thesurfclubatmuriwai.org/wp-content/uploads/2013/08/IMG_4904.jpg, Photographer: Kath Moore.

It is fair to say that up until our encounter with the Client, this stream of the school's live project agenda had got itself into a sort of happy rut. It followed a well-developed path that delivered excellent learning outcomes for students and high quality design speculations for clients. The emotional upheaval that followed our semester 2, 2014 project shifted us.

A project

My colleague Alessandro Melis and I are academic-practitioners, meaning we remain active in architectural practice (including the realisation of buildings) in parallel to (and increasingly as part of) our academic roles. In semester two of 2014 we ran a design topic titled *Through the Space of Representation*.[2] It brought 15 year 3 BAS students together with eight year 1 MArch(Prof) students to speculate as to the development opportunities presented by earthquake prone heritage buildings on 10 different sites scattered throughout the inner suburbs of Auckland. The Client was one of the country's most progressive developers.

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[2] Michael Davis and Alessandro Melis, "Through the Space of Representation," *Design Studio Topic Outline* (Auckland: University of Auckland, School of Architecture and Planning, 2014).

Figure 2. Liam Stumbles, 727-731 & 767-771 Dominion Road - Dominion Road perspective.

One Outcome

Alessandro and I had the benefit of working with a number of excellent students on this live project, including Liam Stumbles (see figures 2-4). The Client became very excited about Liam's project, so excited that he took Liam's final presentation boards to his quantity surveyor. We were not included in any discussion around the pricing of the project and predictably, without the appropriate information, the quantity surveyor came back with an extremely conservative estimate. Despite that, the Client instigated a meeting to discuss Liam's project with Liam, Alessandro and me.

Figure 3. Liam Stumbles, 727-731 & 767-771 Dominion Road - interior perspective.

Given that one aim of our live project was to bring the academy and the market into closer relation we were enthusiastic about the possibility of further developing Liam's proposal. For Alessandro and me it was an opportunity to carry out design research into the delivery of "non-standard" formal outcomes in a modest economy. For Liam it was to unfold as the first design thesis (year 2 of the MArch Prof) in the eight years of the programme that would focus on developed design and technical resolution of a formally complex building.

Figure 4. Liam Stumbles, 727-731 & 767-771 Dominion Road - Halesowen Avenue perspective.

However, in the two weeks between the email I sent to arrange the meeting and when we actually sat down together, our Client's attitude had changed completely. During our meeting he conceded that on the back of the outlandish estimate he had received from his quantity surveyor, he had spoken to two of the architects he uses regularly. It became apparent that they had contributed to his change of heart.

How did this happen?

Could it be that we were dismissed by our solely-commercially-focused peers simply because of our association with academia? But the Client was in possession of material that demonstrated our experience and capacity to complete these kinds of formally speculative projects – we had done so overseas.

Were we dismissed due to the Client's lack of belief in our capability to deliver the kind of project he had been seeking through his brief to us *in an Auckland context?* But I have been located here for 14 of my 20 years in architectural practice.

Was it the "wild-ness" of the speculation? But this was the very thing that we were asked to deliver by the Client, the thing that drew us into this relationship in the first instance.

While all of these questions surfaced in some form or other during our conversation with the Client, the more Alessandro and I looked at it, the more it became clear that we had crossed some sort of line. Apparently, our role was *only* to speculate over this project and, in doing so, to give the Client and his architects a sense of current and future aesthetic flavours so as to give them some sort of competitive advantage in their respective markets. Our role was not to produce such compelling projects that the market share of our solely-commercially-engaged colleagues would be threatened. Exposure to market forces indeed.

As we dwelt on this outcome a strong sense grew that this was evidence of something bigger; a problem that had been present throughout this stream of live projects that had found discernible, disturbing form in this instance. The experience catalysed a period of reflection and investigation that included the writing of this text. The aim was to situate this particular derivative of the live project, to see it through a wider lens and to articulate what it was

confronting. Findings began with the realisation that we were dealing with three distinct parties – the academy, the market and the profession.

Architectural pedagogy and the live project

Internationally the live project is set in relation to a long history of tension in the discipline between the academy (which seeks a more critical engagement with the architectural discipline), the profession (which seeks a more pragmatic engagement with the differing material, economic and social forces that shape architecture) and the market (with its complexity of fluctuating demands)[3]. This problem is well documented in Mitgang and Boyer's 1996 report for the Carnegie Foundation for the Advancement of Teaching, titled *Building Communities: A New Future for Architecture, Education and Practice*.[4] While focused on conditions in the USA and dated in certain respects, the report remains an accurate reflection of demonstrably enduring issues within the architectural discipline.

Every five years the University of Auckland's School of Architecture and Planning is visited by an accreditation panel consisting of international and national experts called a National Visiting Panel (NVP) who review the architecture programmes. They advise as to how we are performing and set goals which are followed through annually by an Interim Review Panel (IRP). Generally, the NVP brings local specificity to the issues Mitgang and Boyer raise in their report. These issues have persisted since the shift of architectural education from an apprenticeship system to a university degree structure, a shift that began in the early 20th century (if not earlier). In other words, the issues raised by the NVP might often be seen to be symptomatic of a larger, persistent condition embedded within the discipline.

Various types of live project might be seen to attend to the concerns Mitgang and Boyer raise in differing ways.[5] But their report applauds design and build type studios especially. Samuel Mockby's *Rural Studio,* while not mentioned by name in the report, is a well-known example of this sort of endeavour.[6] These studios address real projects often in socially and economically challenged communities both to meet immediate needs and to provide social and economic stimulation. Students do it all, grappling with every aspect of architectural production from design through to building their projects on site.

Our school, in 2007, was to establish its own design and build type programme around the Muriwai Surf Lifesaving Club project. However, it quickly became apparent that, due to institutional constraints – health and safety concerns, programme structure and the like – our ambition had to be reformed. Instead, we set up collaborative yet competitive proto-office conditions in the design studio. Each office ultimately had to demonstrate a highly resolved architectural proposition on the strongest terms available to it – from animations through to 1:1 detail prototypes. This set the standard for our live project agenda.

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[3] It is worth noting that having also been exposed to these issues in Australia, Canada, the UK and the Netherlands, nowhere have I found the tension between parties to be as pronounced as in New Zealand. Here, practitioners (too) closely associated with the academy are marginalised as "academics" – in the current cultural climate being so engaged is viewed with puzzlement more than approval. We are notionally excluded from commercial endeavour by the profession and the market – we are not seen as being engaged with reality. It is also worth noting how distressing this situation is for those of us caught up in it because of concerns we share not just for ourselves but for the advancement of the discipline more generally.

[4] Ernest Boyer and Lee Mitgang, *Building Communities: A New Future for Architecture, Education and Practice* (Princeton: Carnegie Foundation for the Advancement of Teaching, 1996).

[5] For example, see the range of projects presented in *Live Projects: Designing With People*, ed. Esther Charlesworth, Melanie Dodd, and Fiona Harrisson (Melbourne: RMIT University Press, 2012).

[6] See, for instance, Andrea Oppenheimer Dean and Timothy Hursley, *Rural Studio: Samuel Mockbee and an Architecture of Decency* (New York: Princeton Architectural Press, 2002).

Outline of a professional condition

To provide a sketch of the local professional environment within which the school's live project agenda has developed: over the course of the past twenty years the building industry in New Zealand has encountered significant change in terms of building regulation and costs. On top of an increasing range of competitors and the proliferation of specialist consultants, the impacts of issues such as the "leaky building crisis," the Christchurch earthquakes, Auckland Council's Unitary Plan and others have resulted in the architectural profession being shouldered with more work and more risk without comparable increases in fees. One celebrated Auckland architect also recently commented that over the past generation the amount of documentation required to submit a house for building consent has increased by a factor of up to eight, but the quality of the architecture has not improved to match.[7]

Outline of a market condition

The traditional role of the architect is to speculate, to document and to act as their clients' agent in the delivery of a built project. When so much more documentation is required within an overall fee that remains essentially unchanged, documentation absorbs the bulk, delivery retains some space, but speculation is squeezed right down. One might quickly surmise, then, that another reason our client bodies come to us is out of a desire for a speculative investigation of the potential their projects hold – the kind of broad design exploration that is not as viable within commercial operations as it is within an academic environment vested in asking "what if…?" type questions.

Outline of an academic condition

Against this background certain pedagogical complexities play out. The "resistance" design tutors sometimes encounter in students at the Auckland school is a particular issue.[8] Resistance is a learning impediment. Reasons for it are manifold. They might include fatigue and fear but may also include a student's sense of self-satisfaction at one extreme, to low levels of self-expectation in terms of their own abilities at the other. It is a quality of student performance that presents as a lack of willingness to take risks such as learning and applying a new software technique. Often, simultaneously, students will present crises of confidence in what they already know. Combined and unchecked this will amount to a kind of paralysis. Inside our live project we seek to break down resistance, to extend students' repertoires, their design abilities and their confidence. Each student is tasked with realising and exercising what might be termed their own architectural *habitus*.[9] They do so through a step-by-step framework that provides local, operational specificity to ideas such as Donald Schön's notion of "reflection-in-action."[10] It results in a self-reflexive process of examination, validation and development of an individual's own ways of drawing, diagramming and modelling.[11]

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[7] David Mitchell in conversation.

[8] Michael Davis, "Engaging in the Space of Representation," in *Studio Teaching Symposium: A Two-Day Symposium Dedicated to Articulating and Sharing Best Practice Studio Pedagogy and Related Research*, ed. Ralph Buck and Nuala Gregory (Auckland, New Zealand: Centre for New Zealand Art Research & Discovery), 105-120.

[9] Pierre Bourdieu, "Habitus," in *Habitus: A Sense of Place,* ed. Jean Hillier and Emma Rooksby (London: Ashgate, 2005), 43-49.

[10] Donald A. Schön, *The Reflective Practitioner: How Professionals Think in Action* (New York: Basic Books, 1983).

[11] See Davis, "Engaging in the Space of Representation" for the first review of this still unfolding model. It focused on unpacking one project vehicle through a discussion of the work of a single student.

Academy-profession-market

Emphases on each student developing their own critical media practices (and their theoretical implications) operate in stark contrast to prescribed and often prosaic requirements of client, site, brief, budget and timelines. We articulate this as a tension between the qualitative and the quantitative, not as a condition to be resolved but as a space of possibility.

Learnings

Our triple focus live project (as it has come to be known) has evolved in relation to these conditions. In responding to market demand for architectural speculation, locally the academy is being drawn out of the margins and into potentially difficult relations with both market and profession. Difficulties immediately apparent include the markets struggle to understand the peculiarities of both academy and profession and a lack of surety as to what to do with the speculative outcomes it desires once it has them. Meanwhile, the profession voices a desire for the academy to be more reflective of its self-perceived needs, but that desire doesn't extend to the point where its relationship to the market is challenged. For its part, the academy sees in the live project the potential for a harmonious nexus of architectural teaching, research and practice. Such a nexus is a "holy grail" of studio teaching, a goal our institutions set out for us in official documentation. But, as we near it, the question begs as to whether they are prepared for these kind of inevitably risky domains to operate. My sense is that they are not.

Further, it may actually be in the dissonance of these relations that opportunities for this triple focus model lie. Live projects run in our studio in this manner since 2007 have demonstrated the learning potential of bringing these relations to the fore and making the space thus established between parties the locus of design speculation. The benefits of acknowledging the inherent difficulties beyond the "petri-dish" of the studio are yet to be explored. Given a suitable project vehicle, if each party was to be problematised in relation to the other in an appropriately facilitated environment, might we see the kind of speculative project Liam produced in studio, subsequently developed, detailed and delivered onsite? Such an outcome is less likely to be produced through pursuing a happy nexus than it is through setting up academy, market and profession to act in critical, discursive ways with each other.

Projecting the future of the triple focus live project

The problem Alessandro, Liam and I encountered with Liam's project is a localised instance of a much larger issue embedded within the discipline. Despite the disappointment we felt as our attempts to take Liam's project to the next stage foundered, we recognised that to have reached the point where we were able to fail in this way we had more than met the aims of our design topic.

Amongst staff and students at the School there is no shortage of motivation to address the problem articulated above and so well illustrated by our experience of working with the Client. While that problem is widespread and enduring, so too is the potential it presents as an area for further research motivated by the desire for solutions. Two projects have crystallised and are in progress: a prequel of sorts which, in a didactic manner, sets out the pedagogical approach we have evolved since 2007; and a sequel looking at a model by which to transition academic projects to commercial environments to realisation onsite whilst privileging the ongoing learning of the students concerned. Initially named the Proto-Practice Unit, it manufactures an interface between academy, profession and market. It is a space of design research that incorporates real-world opportunities for students and recent graduates to develop practical knowledge and skills to support their shift from formal education to industry. The hope is that the unit will prove to be an alternative, generalisable model for the delivery of our triple focus live projects.

Dynamics of bamboo design and build collaborations

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Abstract

Design and construction of a temporary bamboo structure provided the vehicle to explore live and interactive design-led research, extending collaborative partnerships and forging new relationships. Designed for two events of contrasting scale as part of the Dark Mofo annual arts festival hosted by the Museum of Old and New Art (MONA) in Hobart, Tasmania, the project drew on an extensive portfolio of research into traditional and contemporary bamboo structures complied by Sydney-based architecture practice, Cave Urban. It extended Cave Urban's previous partnerships with Taiwanese artist, Wang Wen Chih, and involved collaboration between Cave Urban and students from the University of Tasmania (UTAS) School of Architecture & Design and Tasmanian College of the Arts (TCotA), and on-site assistance from the MONA events construction team.

Construction over a three-week process involved design research that provided new knowledge into bamboo structures and developed new process of Learning By Making as a form of collaborative research-based teaching. Interaction between the team of 25 people shifted between modes of open/closed and flat/hierarchical collaboration, in a dynamic process that lent new definition to the idea of 'live' projects. Design-led research provided the opportunity for an equal number of students and expert collaborators, facilitating an opportunity to explore a master/apprentice model, to expanded practical and theoretical knowledge and expertise through the design and construction of a temporary civic event space.

Keywords: temporary, bamboo, pavilion, collaboration, interactive.

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Dynamics of bamboo design/build collaboration

Collaborative design research between the University of Tasmania (UTAS) School of Architecture & Design at the and Sydney-based architectural practice Cave Urban was central to the design and construction of a bamboo "Hothouse" pavilion for the Dark Mofo arts festival in Tasmania. A process of 'applied enquiry' was central to the project, which expanded Cave Urban's extensive research into traditional and contemporary bamboo structures.[1] The project also provided a unique situated learning experience for the team, extending the Learning My Making (LBM) practices that are central to the UTAS Architecture and Design curriculum.

Bamboo design research

Cave Urban's ongoing design research into bamboo explores the potential of bamboo as a viable building material in Australia through a series of temporary pavilions. Working with Taiwanese artists Wang Wen Chih and engineer Jeremy Sparks, Cave Urban challenge the lack of provision in the Australian building codes for bamboo structures. The Hothouse drew on and extended Cave Urban's extensive portfolio of research into traditional and contemporary bamboo structures, and produced new knowledge through design research methods that can be understood in terms of Christopher Frayling's tripartite model of research *into*/*for*/*through* design.[2] Research *into* design examined bamboo, drawing on precedents and analyzing structural and construction systems, while research *for* design involved a critical investigation of pavilions for performance and public events, both historical and contemporary. The development of prototypes across a range of scales allowed for formal testing of the structural and aesthetic ideas, providing an understanding of the relationship between structure and aesthetics, through processes of research *through* design. Scale models and full-size prototypes were used to evaluate the performance of the structural system, and assumptions were then tested throughout the building process, and examined further during the dismantle process.

Situated Learning By Making

The Hothouse typified the values of the School's LBM programme, which integrates design and building technology through a process of experience-based or 'situated' learning.[3] LBM projects typically involve groups of students working together to design and construct projects, with staff acting as facilitators who provide guidance and practical demonstration of construction processes.[4] The Hothouse employed new modes of engagement between students and supervisors, providing new knowledge into the School's LBM pedagogy and design research portfolio.

The project provided a model of research-based teaching that was characterised by a two-way engagement between students and supervisors.[5] The team of bamboo specialists,

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[1] Ron Griffiths, "Knowledge production and the research-teaching nexus: the case of the built environment disciplines," Studies in Higher Education, 29, 6 (2004): 717.
[2] Frayling, Christopher. "Research in Art and Design", *Royal College of Art Research Papers series,* 1(1) (1993).
[3] Lave, Jean, and Etienne Wenger, *Situated Learning: Legitimate Peripheral Participation*. Cambridge: Cambridge University Press, (1991).
[4] Wallis, Louise. *Learning-by-Making: Design-build studios at the School of Architecture at the University of Tasmania* (Masters thesis, University of Tasmania, 2005).
[5] Griffiths, "Knowledge production", 722.

builders, designers and artists created a platform for interdisciplinary collaborative design-led research (or research *through* design) which was characterised by an iterative process of testing and experimentation. The equal ratio of students to supervisors resulted in a unique master/apprentice model. Students were mentored by a 'master' designer-maker, acting as their assistant or 'apprentice,' developing a broad range of skills including research, experimental design and construction. This developed the students' the skills and confidence to take an increasing role in exploration, decision-making and leadership. This process provided a unique Workplace Integrated Learning (WIL) opportunity, which bridged design research with architecture and construction practices.

Interactive and collaborative design research

The interactive design-led research central to the Hothouse diverged from traditional procurement methods, where the design is developed through sketches and models then documented in general arrangement and detail drawings before implementation on site. The project was structured around four intensive workshops: research and experimentation (grounding), design (ideation), on-site testing and construction (iteration) and dismantle (reflection).[6] Design principles for the overarching spatial and structural strategy were developed through explorative model-making and iterative prototype testing, which was developed throughout the 23-day design/build phase. Each of the stages of site set out, column erection, beam construction, roof cladding, and layering of internal secondary structure involved a high degree of iteration and experimentation.

Workshop 1: GROUNDING – research and experimentation
The first workshop was aimed at the developing the students' understanding of the structural properties and formal possibilities of bamboo through research and practical experiments. Documentation of site conditions and the preparation of site drawings developed an understanding of the site context, and discussions with Cave Urban via Skype mirrored the traditional supervision and mentoring that would occur in practice. Iterative feedback highlighted to the students the need for precision and detail, beyond that of a typical speculative design studio.

Workshop 2: IDEATION – design
The second workshop, which focused on the development of the founding design idea, also served as a basic training session in bamboo construction. Cave Urban lead the collaborative experimentation of ideas with the development of 1:20 scale models and a 1:3 scale prototypes, introducing the UTAS team to research *through* design processes of trial and error that would become central to the on-site design and construction. This lead to an appreciation the overlapping of structural and sculptural qualities of bamboo, and the exploration of alternatives to complex and time-consuming traditional rope-tied joints. This workshop also cemented the interpersonal relationships, developing an understanding of each other's expertise, and the developing the team dynamics. All team members worked together to negotiate the content and format of the drawings for the client presentation, with Cave Urban leading the process and the UTAS team assisting in the production of drawings, renders and montages, and participating in the decision-making about graphic content and format, in a manner that mirrored an architectural practice scenario.

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[6] John Zimmerman, Jodi Forlizzi and Shelley Evenson. "Research through design as a method for interaction design research in HCI", Carnegie Mellow University Research Showcase @CMU, (2007, 1).

Figure 1 : Scale models testing bamboo systems (left) and detail (right). Images: Helen Norrie.

Figure 2: Scale models of structural bay of canopy (left) and pods (right) Images: Helen Norrie.

The brief to create a bamboo structure that could serve both an intimate setting for a think-tank discussion and a large-scale interactive festival event, which was warm and dry in the middle of winter, was wildly optimistic. The conceptual idea of the Hothouse as a hybrid of a bamboo forest and a Gothic cathedral was developed into a strategy for a series of triangular bays that formed the scaffold for the structure of the 40-metre long canopy that would become the backdrop for the Dark Mofo Winter Feast. A 'conversation pit' with a hearth and

four independent cocoon-like pods positioned in the central bay of the canopy provided a more intimate setting for the smaller-scale think-tank event.

Workshop 3: ITERATION – on site testing and construction
Experimentation and testing continued on site, with the construction process becoming an exercise in large-scale prototyping to test and experiment with different structural and formal ideas. Understanding the physical properties of the bamboo was central to the process. Four different species of bamboo were used, and it was necessary for the team to be able to visually identify the different types and to understanding of the specific structural characteristics, particularly flexibility and strength, so this could be factored into the design decision-making. The bamboo was not as flexible as was initially anticipated, and after an exhaustive process of experimentation, the initial strategy of forming each of the five bays from a series of overlapping 'Gothic' arches, was replaced by structural system of columns and curved beams.

Each stage of the assembly involved a process of testing to see what worked, and adapting the overall strategy and the detail of each component to suit. This required an evaluation of structural systems, techniques, formal composition and detail, highlighting the nexus between structure and aesthetics that is central to bamboo construction. This required a coordinated approach, with one team focusing on the construction of the elements and the other on the effect that each element was having on the overall structure, and then adjusting the overall design to suit. This created an ongoing process of testing and critical reflection, continually building knowledge about the performance of the structural system, with each team member becoming an active agent in the critical analysis of the design process.

Figure 3: Central bay of canopy (left) and column and beam junction (right). Images: Helen Norrie.

Figure 4: Roofing complete on central bay (left) and end bay (right). Images: Helen Norrie.

This process of reflection-in-action is central to Cave Urban's design/build/research process and it creates a dynamic and reflexive form of praxis, expanding the limits of knowledge to create projects that are as much experimental installations as they are ideas for buildings.[7] Cave Urban embrace experimentation as part of the process:

> Our philosophy as a firm is to use research to investigate a different approach to architecture that tests *in situ* what we can and can't do with a material. At times that means two steps forward and one step back, but we find this process allows for the best result in a design that utilise non standardised materials. For us design is all about flexibility and being open to the notion of new possibilities, if an opportunity presents itself. For those used to a more conventional way of doing things, this can be at times challenging and frustrating.[8]

Workshop 4: REFLECTION – dismantle and review
Dismantling the temporary structure completes the research, with the strength tests carried out to examine the possible loads that the structure could carry. This information was fed back to the engineering team, and will inform the next project. The construction process was also documented by the team, including drawings of jointing techniques which can be shared on future projects.

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[7] Fraser, Murray. *Design Research in Architecture: an overview.* (Farnham, England; Burlington, USA: Ashgate, 2013).
[8] Personal correspondence with Cave Urban, August, 2015.
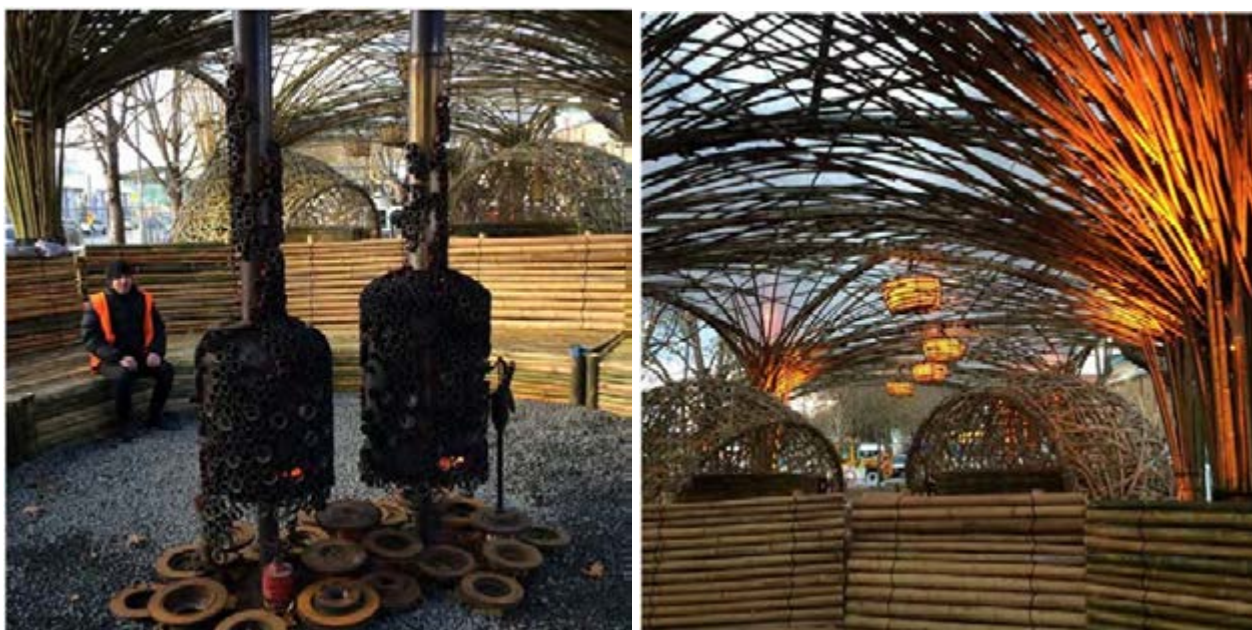
Figure 6: The conversation pit (left) and pods under canopy (right). Images: Helen Norrie.

Reflecting on design-led research

Critically reflecting on the process of collaboration yields a further field of enquiry that extends the processes of research *into/for/through* design to include research *about* design, which 'enquires into what takes place when design is undertaken, and then seeks to find methods to improve or refine the observed activity.'[9] The process of grounding/ideation/iteration/reflection parallels the Design Council's Double Diamond Model of four phases of the design processes: discover, define, develop, and deliver. [10] The discovery phase involves research that informs the definition of the project in the second phase, clarifying the project objectives and scope. The third stage involves the development of the project, testing ideas, evaluation, iteration and feedback, leading to the final project delivery. In the Hothouse project, the definition between discover/define/develop/deliver became blurred. Although the design was developed and presented to the client in the initial phase, new discoveries helped to continually redefine the direction, this reinforced the importance of the 'develop' stage as a process of iterative design research, which involved the constant refinement of the relationship between form and structure. This dynamic process was necessary to accommodate the unpredictable nature of the building material and the fast pace of the construction. This open-ended process provided opportunities for exploration, which allowed the form of the structure to evolve as discoveries about the material and construction process were revealed.

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[9] Murray *Design Research in Architecture*, 95.
[10] "A study of the design process". Design Council UK. Accessed October 1, 2017.
http://www.designcouncil.org.uk/sites/default/files/asset/document/ElevenLessons_Design_Council%20(2).pdf

Figure 7: The Hothouse during the Dark Mofo Winter Feast.

Reflecting on the interactive design research collaboration

Analysis of the different modes of collaboration that were central to the project provides new knowledge and critical reflection on Learning By Making practices. Robert Verganti and Gary Pisano's definition of the intersecting scale of open/closed and flat/hierarchical structures provides a scaffold for analysis. Open collaboration allows for all group members to participate equally, whereas closed structures involve a selected group of participants. Flat structures encourage participation in decision-making by all group members, while hierarchical structures define particular decision makers. This results in four modes of collaboration: closed hierarchical (*elite circle*); open hierarchical (*innovation mall*); open and flat network (*innovation community*) and closed flat structures (*consortium*).[11] In the Hothouse, the collaborative relationships shifted along a sliding scale of open/closed and flat/hierarchical throughout the various phases of the project, and this process of transition was generally fluid and tacit rather than preconceived and directed.

During construction, the teams from Cave Urban and UTAS School of Architecture & Design, were joined by volunteers from the UTAS Tasmanian College of the Arts (TCotA) and the MONA events construction crew. This meant that the ratio of skilled and experienced *masters* (bamboo specialists and construction crew) and *apprentices* (architecture and art students) was roughly one to one. All the tasks required teamwork, and each team was formed around the guidance and leadership of a master. As the students gained expertise and an understanding of the structural system, they transitioned from apprentice to master, and were able to mentor their peers. This resulted in more complex and fluid modes of collaboration, which shifted as team members developed skills and confidence.

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[11] Verganti, Roberto, and Gary P. Pisano. "Which Kind of Collaboration Is Right for You?" *Harvard Business Review* 86, n. 12 (December 2008).

Generally, collaboration was characterized by an open, flat structure developed through both a self-determining and predetermined (or presumed) hierarchy. However, at particular points it was necessary to delegate decision-making to a smaller group of people, which reshaped the open, flat structure to a temporary closed flat or hierarchical structure. The pace of the project, particularly in the initial stages, and the tentativeness of students to advance ideas, led to Cave Urban taking charge of the process by presenting the key ideas for testing and exploration. This created an open hierarchy, in that all group members were involved in a collaborative process that was led by Cave Urban. The complexity of the project, the number and varying skills of people involved and the tight timeframe also influenced the modes of collaboration. This lead to a shifting open/closed hierarchy that involved leadership from more engaged and proactive team members. On site, it was periodically necessary for 'executive decisions' about construction and aesthetics were made by Cave Urban, due to their experience and their ultimate responsibility for the project.

The difference between the investment of the architecture students in the project as a part of course work, and the art students' voluntary engagement in the project created a tacit hierarchy. However, the peer-to-peer collaboration eroded divisions as participants shifted position between 'master' and 'apprentice' and moved between tasks, mastering each and then mentoring others. This provided a dynamic, collaborative environment, that shifted between open/close and flat/hierarchy depending on the tasks at hand, and the initiative and skills of participants.

Interestingly, the art and architecture students approached the design-build process differently, with the art students operating from a perceived sense of 'freedom' to experience the project from a volunteer's perspective. The art students generally exhibited a willingness to freely experiment, drawing upon their rich background of fluid creativity, and confidence with open-ended exploration. Their voluntary engagement did not necessarily affect their commitment to the project, with several of the art students equally invested in the project and committed to their ongoing engagement. This positively impacted on perceived hierarchy, with the art students who regularly attended becoming a core part of the decision-making team.

In contrast, the architecture students were initially more tentative, in part because of project's close coupling with coursework, which fuelled a sense of responsibility for the final outcome, and a sense of urgency and efficiency that at times resulted in a reticence to allocate time towards 'unnecessary' trial and error. It was challenging for some of the architecture students to adjust to the experimental process of testing and 'on the spot' design and problem solving, to embrace a preparedness redo parts of the project to accommodate both structural and aesthetic issues, and to embrace the embryonic process that required them to take risks and experiment.

Conclusion

The collaboration with Cave Urban extended design research into bamboo structures, providing new knowledge about structural systems. The project also provided a new model of collaborative engagement for the UTAS School of Architecture & Design Learning By Making programme. Cave Urban's experience of working with large teams of volunteers was invaluable, as they shepherded the participants' transition from apprentice to master collaborator. The iterative and experimental nature of the project presented a far more dynamic process than the architecture students were used to. It contrasted strongly with traditional design studio process that revolves around a rigid tutor to student discourse

whereby a student produces work which is then critiqued by the tutor, providing instruction for additions, adaptions and changes. Compared with the structured studio environment, the experimental design-build process was characterized by a perceived lack of procedural clarity, due to the rapid evolution of construction techniques and the absence of explicitly structured relationships between collaborators.

The use of bamboo provided unique opportunities for learning about the relationship between structure and form. Bamboo is ductile, yet unpredictable, but does not fail catastrophically as its long fibres and natural structure are more akin to a combination between rope and steel. The use of mostly hand tools for construction and repetitive tasks with a low level of expertise allowed participants to build confidence and resilience in a safe environment. This helped to build an arena where the stakes were low in terms of risk, and the opportunities for experimentation were high. Establishing an overarching a structural and spatial strategy that allowed the details to be designed onsite, providing a framework for exploration that provided a great amount of scope and flexibility.

The project required on the spot problem solving, communication and decision making, and through this process teams were able to gain experience and resilience as part of the architectural process. Throughout the project the UTAS team's confidence with this new process developed, allowing them to become key members of the collaborative design-led research into bamboo structures They commented on how this process highlighted the need for confident and quick decision making, and the importance of communication within the team and the need to work strategically in order to meet the time frames of the project. They recognised the need to embrace the experimental nature of the project, and to value testing and trial and error as a research tool that expanded understanding of structural and spatial possibilities of bamboo construction.

Nici Long, from Cave Urban, observers that unlike traditional building processes, bamboo construction creates a unique, and striking, sense of harmony on site. As each individual develops skills and understanding of the system and processes, teams work collectively towards a common goal, and construction progresses through a series of simple repetitive tasks. She suggests that this creates a "hive mentality" with each person moving between tasks as required. Although the construction involves ostensibly simple and repetitive tasks, it is also an iterative and exploratory process that requires judgment to be constantly exercised to mediate between the structural and sculptural qualities. Throughout the process whole crew was directly involved in the dynamics of collaboration; they were intertwined in the complex, and sometime fraught, negotiations between design and construction.

Although the neither the process nor the actual project is necessarily replicable, its relevance defines the project as design research, with the dynamic nature of the process lending a new definition to the idea of 'live' projects.[12] The design-led research expanded practical and theoretical knowledge into bamboo structures, and provided new understandings for the pedagogy of situated learning that will continue to inform future projects collaborative design and build projects.

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[12] Zimmerman et al., " Research through design as a method for interaction design research in HCI" (2007, 7).

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Digital matter as interdisciplinary commodity

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Abstract

With the current exponential growth in the sector of Spatial Data Technology and Mixed Reality display devises we experience an increasing overlap of the physical and digital world. Next to making data spatially visible the attempt is to connect digital information with physical properties. Over the past years a number of research institutions have been laying the ground for these developments. In contemporary architecture architectural design the dominant application of data technology is connected to graphical presentation, form finding and digital fabrication.

The *arc/sec Lab for Digital Spatial Operations* at the University of Auckland takes a further step. The Lab explores concepts for a new condition of buildings and urban patterns in which digital information is connected with spatial appearance and linked to material properties. The approach focuses on the step beyond digital re-presentation and digital fabrication, where data is re-connected to the multi-sensory human perceptions and physical skills. The work at the Lab is conducted in a cross disciplinary design environment and based on experiential investigations. The arc/sec Lab utilizes large-scale interactive installations as the driving vehicle for the exploration and communication of new dimensions in architectural space. The experiments are aiming to make data "touchable" and to demonstrate real time responsive environments. In parallel they are the starting point for both the development of practice oriented applications and speculation on how our cities and buildings might change in the future.

The article gives an overview of the current experiments being undertaken at the arc/sec Lab. It discusses how digital technologies allow for innovation between the disciplines by introducing real time adaptive behaviours to our build environment and it speculates on the type of spaces we can construct when *digital matter* is used as a new dynamic building material.

Keywords: reactive architecture, digital matter, haptic-digital space, digital spatial technologies, arc/sec.

Architecture creates and utilises the space in which we live and operate. In our daily experience this space is characterised by the co-existence of the physical and the digital world. With the recent exponential developments and the availability of mixed reality devices and spatial data technology, both worlds are increasingly intertwining. With data as unified source of exchange, these technologies offer a common ground for interdisciplinary explorations and discoveries. The linkage between data, space and materiality allows allow to go beyond two dimensional screen interaction towards a towards responsive spatial environments. The newly released developer version of the Microsoft HoloLenses[1] and the highly anticipated Magic Leap[2] glasses by Google are about to bring recent science fiction scenarios to life. This latest generation of augmented reality devices allow for gesture-based operation of spatial data, as in Tom Cruise's famous scene in Minority Report,[3] from 2002, and the natural interaction with the coexistence of holographic and physical objects, as envisaged in the Iron Man movie series,[4] from 2008, 2010 and 2013.

But as well as giving data a visual, local, spatial appearance through stereo displays, these new devices will allow for more, as integrated GPS, giros and scanning sensors identify location, the surrounding environment and objects. Effectively, this enables us to connect physical material with digital information, and the 1:1 calibration of the digital and physical world allows us to give data a tangible appearance.

An exemplary application of this strategy is the newly conceptualised entertainment centre the VOID, which is advertised to open globally by the end of this year: "Utilizing a layering of real-time interactive environments, and blending the real world with the digital, our participants are placed into our Hyper-Reality experiences."[5]The VOID project achieves this experience by overlaying the virtual world, displayed through Oculus Rift technology, with a physical build environment combined with pressure suites and kinetic machinery. The project is exemplary, as it demonstrates our desire to connect data to multisensory properties. This desire appears as a logical consequence given that human senses have evolved through the interaction with the physical world.

Hyper-Reality environments have been a fascinating and inspiring proposal in science fiction environments. A very early and well known example is the "Holodeck" in Star Trek's *Next Generation.*[6] It is the vision of a computer-controlled room to generate holographic matter: usable, consumable and fully interactive as a responsive world with artificial life forms. Over the past years, institutions such as the *Media Lab* at the Massachusetts Institute of Technology (MIT) have been investigating the background of these speculative scenarios. Of specific interest here is the research of MIT`s Media Lab into *tangible data* and *radical atoms.*

The Tangible Media Research group aims to elevate data from 2D screen-based graphical user interfaces (GUI), to 3D tangible user interfaces (TUI), and eventually to programmable matter. The director of the group, Professor Hiroshi Ishii, calls this type of matter *radical*

[1] "Microsoft Hololenses", accessed August 20, 2016. https://www.microsoft.com/microsoft-hololens/en-us.
[2] "Magic Leap". Accessed August 20, 2016. https://www.magicleap.com/.
[3] *Minority Report*, directed by Steven Spielberg (Amblin Entertainment, Cruise/Wagner Productions, 2002).
[4] *Iron Man*, directed by John Favreau (Marvel Studios, 2008); *Iron Man 2*, directed by John Favreau (Marvel Studios, 2010); *Iron Man 3*, directed by Shane Black (Marvel Studios, 2013).
[5] "The VOID". Accessed August 20, 2016. https://www.thevoid.com/.
[6] *Star Trek -The Next Generation,* produced by G. Roddenberry, and R. Berman (Paramount Domestic Television, 1984-1994).

atoms[7] and summarises the attempt in the vision "to seamlessly couple the worlds of bits and atoms by *giving dynamic physical form to digital information and computation*."[8] The Tangible Media Group has developed a series of projects to test these ideas; amongst them are the kinetic installation *inFORM* [9] and the video animation *Perfect Red*.[10]

InFORM (figure 1) demonstrates the concept of a TUI as *a* "Dynamic Shape Display that can render 3D content physically, so users can interact with digital information in a tangible way. InFORM can also interact with the physical world around it, for example moving objects on the table's surface. Remote participants in a video conference can be displayed physically, allowing for a strong sense of presence and the ability to interact physically at a distance."[11]

The interaction conceptual video animation *Perfect Red* (figure 2) explains the idea of radical atoms. The video describes "a clay-like material pre-programmed to have many of the features of Computer-Aided Design (CAD) software. Perfect Red is a fictional material that can be sculpted like clay…and responds according to rules inspired by CAD operations, including snapping to primary geometries, Boolean operations, and parametric design. The idea of snapping to primary geometries such as sphere, cylinder, and cube was inspired by shape-memory alloys. … Perfect Red is imagined as one of a number of new materials imbued with a complex set of responsive behaviors."[12]
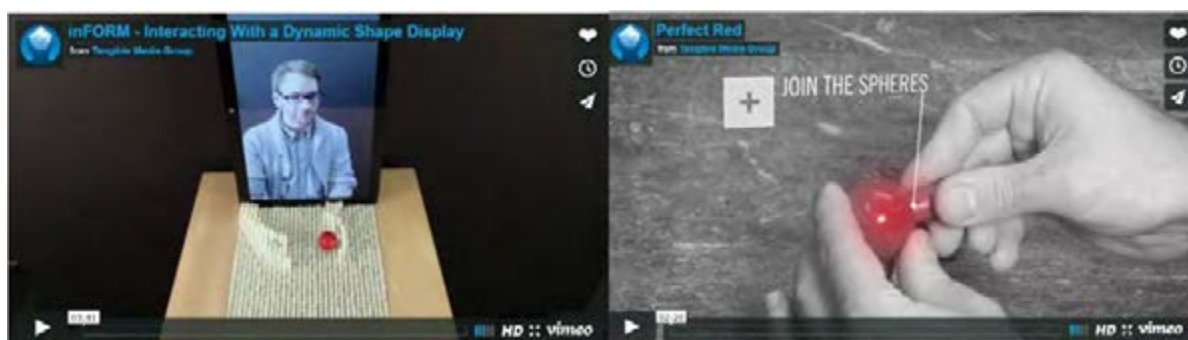
Figure 1 (left). inFORMhape shift display, MIT Media Lab, 2013.
Figure 2 (right). Perfect Red, digital matter, MIT Media Lab, 2012.

With the ability to create programmable space displayed through a new generation of wearable AR devices and the application of programmable materials, we are entering a new type of living environment. The traditional separation of computer and user is being dissolved, towards a "perspective that acknowledges how people, computational materials,

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[7] Hiroshi Ishii, Dávid Lakatos, Leonardo Bonanni, and Jean-Baptiste Labrune, "Radical Atoms: Beyond Tangible Bits, Toward Transformable Materials", *Interactions* 19, n. 1 (2012): 38–51.
[8] "Vision Statement", MIT Media Lab, Tangible Media Group. Accessed August 20, 2016.
https://www.media.mit.edu/research/groups/tangible-media.
[9] *InFORM,* MIT Media Lab, Tangible Media Group. Accessed August 20, 2016.
http://tangible.media.mit.edu/project/inform/.
[10] Leonardo Bonanni, Hiroshi Ishii, Austin Lee, Paula Aguilera, and Jonathan Williams, *Perfect Red*, MIT Media Lab, Tangible Media Group. Accessed August 20, 2016. http://tangible.media.mit.edu/project/perfect-red/.
[11] "InFORM," http://tangible.media.mit.edu/project/inform/.
[12] Bonanni, Ishii, Lee, Aguilera, and Williams, *Perfect Red*.

and even traditionally non-computational materials are coming together as a whole, forming our experiences in and of the world."[13] This new view of human computer interaction (HCI) was discussed and formulated in a panel titled "Material Interactions— From Atoms and Bits to Entangled Practices" at the ACM CHI Conference in 2012. The different viewpoints taken had two aspects in common. The connection of HCI to the material-based design disciplines and the focus on the user experience: "It also simultaneously prompts us to conceptualize computers not as black boxes, but as yet another design material operating in concert with other physical materials—again, with a focus on what these material assemblages can enable in terms of new user experiences and new practices."[14]

Digital technologies allow designers and engineers to introduce dynamic behaviours and to create adaptive schematics, which expand conventional practice and the understanding of architecture as a static and rigid element. In contemporary architectural design, data technology is still connected to graphical presentation, form finding and digital fabrication. While real time, responsive relationships are normal attributes of the digital realm, the question still remains as to what type of environments we can generate when data appears to be physical in space and what type of spaces we can build when data is used as an interactive construction material, complementing traditional materials like stone, concrete, glass etc. The designer and film-maker Keiichi Matsuda, with his work, attempts to give some answers to the implications of emerging technologies for human perception and the built environment. His latest online video *Hyper-Reality*[15] documents the overwhelming opportunities for design, the challenges of interaction and threats of triviality. But it also makes clear how important it will become for human wellbeing to start developing design principles for haptic-digital environments.

It is within this context that we have conceived the arc/sec Lab for Spatial Digital Operations at the School of Architecture and Planning at the University of Auckland in 2015. The lab explores concepts for new conditions of buildings and urban patterns, in which digital information will be given spatial appearance and physical form. The approach focuses on the next step beyond 2D graphical presentation and 3D digital fabrication, where data operates with tangible properties. While multinational companies are rapidly developing new spatial digital technologies, the objective of the arc/sec lab is to apply technology and explore haptic-digital space specifically from an architectural design perspective.

Based on the recent experience with New Zealand's inter-school project *Studio[]Christchurch,* the Lab has adapted its three key principles: "teamwork, cross-disciplinary collaborations and collective learning."[16] By developing a continuously growing body of work, the investigations are goal oriented, applied and long term. The purpose of our research is to expand architectural understanding of real time reactive environments.

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[13] Mikael Wiberg, Hiroshi Ishii, Paul Dourish, Anna Vallgårda, Tobie Kerridge, Petra Sundström, Daniela Rosner, and Mark Rolston, "Materiality Matters—Experience Materials," *Interactions* 20, n. 2 (2013): 54–57. doi:10.1145/2427076.2427087

[14] Wiberg, Ishii, Dourish, Vallgårda, Kerridge, Sundström, Rosner, and Rolston, "Materiality Matters— Experience Materials", Interactions *20*, 2 , 2013, 54–57, DOI: 10.1145/2427076.2427087

[15] Keiichi Matsuda, *Hyper Reality.* Accessed August 20, 2016. http://hyper-reality.co/.

[16] Uwe Rieger and Camia Young, "Design Through Collective Learning," in *Studio Futures: Changing Trajectories in Architectural Education,* ed. Donald Bates, Vivian Mitsogianni, and Diego Ramírez-Lovering (Melbourne: Uro Publications, 2015), 59-76.

We are interested in user interaction and navigation in haptic-digital space by adding dynamic properties to the traditional perception of static architecture.

The underlying research question of the arc/sec projects is: What are the functional, programmatic and aesthetic design parameters for interactive environments that use digital matter as a new source of construction material? The arc/sec lab utilises large-scale interactive installations as the driving vehicle for the exploration and communication of time-based architectural design. We are developing prototypical space and immersive environments for two reasons, to demonstrate new ideas of reactive architecture and to learn how the user navigates and understands haptic-digital space. While it is not yet technically possible to generate free spatial holograms or free-forming digital matter, it is , within limits, possible to construct a sense of digital matter by using traditional 3D projection strategies in combination with latest scanning technology and real time rendering software.

The following three arc/sec projects, which are using different methods to generate a real time responsive environment and the sensation of tactile data space, demonstrate the potential of the research.

HyperSpace (figure 3) creates an augmented (hyper) reality world by illuminating haze particles. Large 3D constructions of light appear interactively in space. They are visible without the need of any additional devices such as goggles, screens, helmets etc. The setup combines a live-render gaming engine with a motion-capture system and multiple laser projectors. Virtual world and physical environment are calibrated one to one. The outcome is a full 360 degree haptic–digital space, accurately defined in all dimensions, interactive and inhabitable (figure 4). The installation reacts to body moment, body functions, sound and other environmental factors in order to generate architectural space.
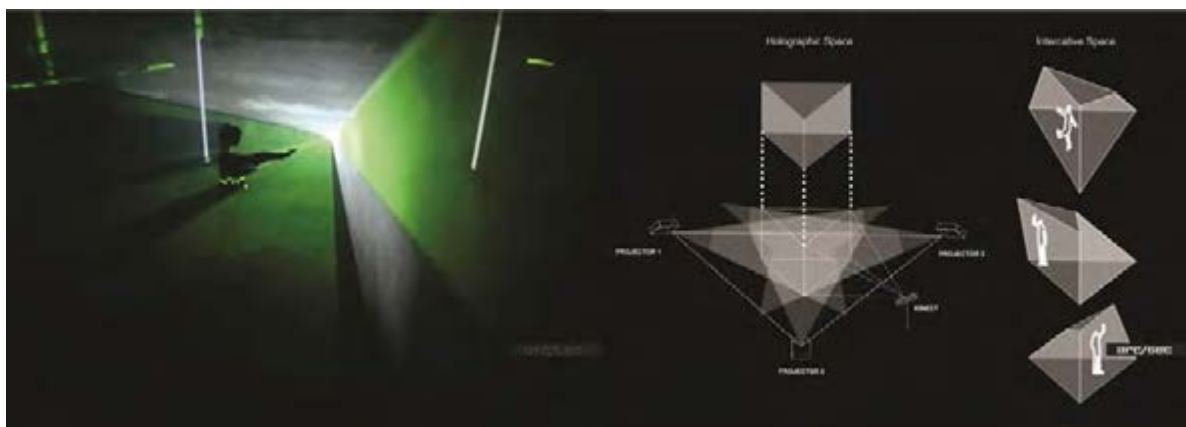
Figure 3 (left). HyperSpace, illuminated haze particles.
Figure 4 (right). HyperSpace interactive holographic volumes (drawing Yinan Liu).

The technical background was developed with a team of postgraduate students at the arc/sec Lab in 2015. The expanded version, *SINGULARITY*, was explored as a master's thesis project by Yinan Liu and Ying Miao in 2016. The project runs in collaboration with dance studies and the Sonic Arts Department at the University of Auckland. A public 40 minute test performance was presented at the Kenneth Myer Centre in Auckland on June 4, 2016. The final 70 minute show, featuring national and international dance and sound artists, is

scheduled for November 2 in the renowned Q-Theatre in Auckland. As an architectural project it explores HCI with digital constructions and digital matter.

The *LightScale II* installation (figure 5,6) generates a tactile experience of 3D data through projections onto multiple layered gauze surfaces. The kinetic structure consists of a 20-metre long carbon mast construction, surrounded by multiple layers of black mesh. The construction is mounted asymmetrically on a single pin-point support. On a touch of the visitor this allows the construction to oscillate in space, freely and with almost no friction. A tracking system recognises the position and movement of the *LightScale.* A live-render program overlays the physical construction with projected digital information. The installation combines three types of data sets: Firstly, place bound information which only appears in specific positions; secondly, tracked data following the kinetically moving object; and thirdly, responsive data which corresponds to the user interaction with the *LightScale.* Like a giant creature, it floats through a virtual ocean materialising environments, stories and user interactions. The project has its roots in a design by kunst und techink [17] (R. Hartl, M. Janekovic, U. Rieger, H. Schroeder) in Berlin in end 90's. Equipped with latest digital spatial technologies LightScale II now advances towards an responsive navigation tool that creates haptic-digital constructions and materializes spatial narratives.

Figure 5 (left). LightScale II, 20 m long carbon construction at the New Cathedral Linz Austria.
Figure 6 (right). LightScale II, physical construction and augmented data sets (drawing Yiqiu Hong).

Anaglyph is a 3D display system (figure 7,8) that puts multi-layered digital information into a spatial order. The installation augments a physical setup with digital information by using the well-known red/cyan stereo projection system to generate virtual 3D constructions. The prototype installation was tested with a team of 3rd year architecture students in the first half of 2016. It consists of a 4m x 8 m curved screen, a simple Kinect camera and 4 laser projectors to create an interactive and immersive environment that allows a display of data in the form of text, images, drawings and sound. The unique features of the *AnaGlyph* installation are its sculptural haptic-digital quality and its spatial architectural navigation system.

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[17] Angelika Schnell, "Kunst und Technik eV.", *in Young German Architects 2*, (Germany: Birkhaeuser Verlag 2000) , 88-96.

In collaboration with the South Pacific Department at the Auckland War Memorial Museum, an applied version is currently under development. The aim is to make the museum`s extensive data archive on the Pacific Islands, their history and culture, accessible with a specific focus on migration and maritime travel. The new setup will use an advanced tracking system to pick up user interaction with displayed physical navigation tools and artefacts. The setup allows access to information as a new haptic-digital museum experience. The main architectural investigation of this project is the spatial organisation of data and how this data can be combined with physical objects and physical navigation tools

Figure 7 (left). AnaGlyph, 3D digital constructions generated through red/cyan projections
Figure 8 (right). AnaGlyph, digital construction overlayed with physical navigation tools.

The principle of projecting onto layered surfaces to generate spatial appearances is well known. It is used for both, to generate spectacular entertainment shows and refined artistic projects. Examples for this are the mesh projections by Nonotak Studio[18], such as Daydream V2 1, and Anthony McCall's Solid Light Works[19] , that work with illuminating fog particles. What makes the arc/sec projects distinct is the 1:1 calibration of an interlinked virtual world with a physical setup. The space generated is not a 2D animation creating a 3D effect, rather it is a precisely calculated environment, defined in three dimensions by using a spatial sensors and an array of data projectors. From the beginning the design process integrates physical and digital reality and the outcome is a fusion of both worlds, creating a new form of haptic-digital materiality and responsive architecture. Research and experiments at the arc/sec lab are not to aiming for a new technical invention, but to discover the unknown through making new connections between the disciplinary knowledge. In our recent collaborations with dance, music, engineering and medical science, it became evident that data is the shared ground and the common source for interdisciplinary operation. Data is interchangeable; it may appear as music, images, calculations, text, programs, sensor inputs and outputs, etc. Spatial-digital technologies offer a link between the disciplines and are the shared tools with which to process data as raw material. As the authors of the article "Materiality Matters—Experience Materials" conclude, "acknowledging the computational as a material is indeed a radical shift in

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[18] Nonotak Studio, *Daydream V.2. Accessed* July 19, 2017. http://www.nonotak.com/_DAYDREAM-V-2
[19] Anthony McCall, Current and Upcoming". Accessed July 19, 2017. http://www.anthonymccall.com/

perspective in HCI—a shift from how IT is applied toward a focus on the material character of IT." [20]

With data acquiring spatial-visual appearance, sensory properties and physical presence we will not only need to redefine HCI, but consequently our interaction with the built environment. Architecture as a spatially operating design discipline, with its ability to coordinate multidisciplinary construction processes, is hereby in an ideal position to facilitate this journey of new discoveries.

Figure 9. LightScale II at the Ars Electronica Festival, New Cathedral Linz, Austria, 2017.

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[20] Wiberg, Ishii, Dourish, Vallgårda, Kerridge, Sundström, Rosner, and Rolston, "Materiality Matters—Experience Materials", Interactions *20*, 2 , 2013, 54–57, DOI: 10.1145/2427076.2427087

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The Augmented Meta-Public Space.
Interpreting emerging transductive territories in enhanced centres of consumption

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Abstract

Recent socioeconomic and technological advancements are transforming the routines of consumption into post-consumerist practices. From a socio-spatial perspective, this is primarily driven by the augmentation of two main processes: prosumption and transduction. Addressing the condition of public space in rapidly developing cities in East Asia and Australasia, this paper discusses how these two forces have contributed to a novel spatial dimension: meta-publicness. The discussion is theoretically framed by two main streams of the research on public space: the one that approaches it as the irreducible realm of agonistic pluralism and the one which sees it as crucial to socio-spatial ontogenetic processes. The major recent concept adopted in the new civic mall planning and management, experientiality, is discussed considering two main aspects: the role of eventful spectacularised environments in these hyper-mediated depoliticised spaces, and the re-politicising agency of their hyper-mediated connectedness. This paper concludes that if a democratisation of the spectacle has introduced relevant antagonistic decommodification forces, there is an internal weakness of the system that exposes these places to an even higher hegemonic dominance.

Keywords: public space, meta-public space, spatial transduction, presumption, shopping malls.

> " *We share a vision of cities for all, referring to the equal use and enjoyment of cities and human settlements, seeking to promote inclusivity and ensure that all inhabitants, of present and future generations, without discrimination of any kind, are able to inhabit and produce just, safe, healthy, accessible, affordable, resilient and sustainable cities and human settlements to foster prosperity and quality of life for all.*
> United Nations[1]

The meta-public space and the metamorphosis of the mall: From hybrid consumption to advanced transductive prosumption. In modern cities, transformations of spatial patterns, technology and lifestyle have brought about a rapid evolution of the social role of enclosures of shopping and entertainment. From being spaces of *pure consumption,* the malls became spaces of *hybrid*[2] *and relational*[3] *consumption,* and, eventually, morphed into places of *post-consumption.*[4] The latest transformation is particularly important as it has posed a serious challenge to consumption as the fundamental propelling force of these discrete urban elements. Post-consumerist practices emerge as malls tightly integrate the multiple realms of everyday life in dynamic assemblages of shopping, entertainment, work, culture and relational life, where non-retail operations are substantively expanded, urban amenities comprehensively incorporated and elements of civic identity abundantly added. Although this evolution of malls has had a global character, its manifestation in certain social, cultural and geographical contexts has shown important differences. In East and Southeast Asia (particularly China and Indonesia) and Australasia (Australia and New Zealand), in cities that have developed rapidly, framing what has been dubbed *post-civil*[5] society, these transformations have catalysed the formation of a peculiar variation of

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[1] United Nations, "*New Urban Agenda: Quito declaration on sustainable cities and human settlements for all,*" in *United Nations Conference on Housing and Sustainable Urban Development,* Habitat III Quito, Ecuador, October 2016, 2.

[2] Alan Bryman, *The Disneyization of Society* (London: Sage, 2004), 57-78; Simon Beames and Peter Varley, "Eat, Play, Shop: The Disneyization of Adventure," in *Adventure Tourism: Meanings, Experience and Learning,* ed. Steve Taylor, Peter Varley, and Tony Johnston (London: Routledge, 2013), 77-84; Jeffrey S. P. Hopkins, "West Edmonton Mall as a Centre for Social Interaction," *The Canadian Geographer* 35, n. 3 (1991): 268-279; Rob Shield "Spaces for the Subject of Consumption," *Lifestyle Shopping: The Subject of Consumption* (London: Routledge, 1992), 1-20.

[3] Jonathan Murdoch, *Post-Structuralist Geography* (London: Sage, 2006); John Allen, "A More than Relational Geography?," *Dialogues in Human Geography* 2, n. 2 (2012): 190-193; Shaked Gilboa and Iris Vilnai-Yavetz, "Shop Until you Drop? An Exploratory Analysis of Mall Experiences," *European Journal of Marketing* 47, n. 1-2 (2013): 239-259; Johan Hagberg and Alexander Styhre, "The Production of Social Space: Shopping Malls as Relational and Transductive Spaces," *Journal of Engineering, Design and Technology* 11, n. 3 (2013): 354-374.

[4] Halina Brown, Maurie Cohen, and Philip Vergragt, eds., *Social Change and the Coming of Post-consumer Society: Theoretical Advances and Policy Implications* (London: Routledge, 2017).

[5] Michiel Dehaene and Lieven De Cauter, "Heterotopia in a Postcivil Society," *Heterotopia and the City: Public Space in a Postcivil Society,* ed. Michiel Dehaene and Lieven De Cauter (Abingdon, Oxon: Routledge, 2008), 3-9; Rodrigo Satcedo, "When the Global Meets the Local at the Mall," *American Behavioral Scientist* 46, n. 8 (2003): 1084-1103; Mark Gottdiener, *The Social Production of Urban Space* (Austin: University of Texas Press, 1985): 248-249; Lynn Staeheli and Don Mitchell, "USA's Destiny? Regulating Space and Creating Community in American Shopping Malls," *Urban Studies* 43, n. 5/6 (2006): 977-992.

the newest paradigm: the civic megamall.[6] This variation has emerged as a response to a highly dynamic urbanism made by multi-scalar networks of agglomerations, semi-random juxtapositions and exacerbated segmentations.[7] The new malls have contributed to the unprecedented process of fragmentation of urban structures, social relations and everyday practices of local communities, supporting the progressive erosion of public space and the unrelenting privatization of the urban landscape. The entirely private spaces of these civic malls have reframed the public condition of socio-spatial relationality of large portion of the population living in their trade areas. They have become primary nodes of social interaction in the highly dislocating urban environments of decentred post-utopian cities.[8] Within the public sphere, they have assumed a compensatory networking agency that enables new forms of collective territorialisation.

These new civic elements provide spatial anchoring for otherwise despatialised interaction and have given rise to a novel dimension of publicness that we identify as *meta-publicness*. Our definition of a domain as meta-public applies to instances of coextension of public and private spheres that elude the binarism of the traditional classification of the publicness of spatial realms. More precisely, meta-public domains result from the loosening of boundaries in the *quasi-public* spaces of the preceding mall types, and the institution of hybrid, ambiguous and ambivalent territories, where public/private thresholds – though still heavily policed by hegemonic actors – lose part of their power to limit public access and engagement.

Intending to contribute to the discussion on the socio-spatial effects of the new condition of publicness, this paper elaborates upon the tenet that the profound changes in routines and actions in daily urban relational life are associated with the augmentation of two processes: *prosumption* and *transduction*. These are socio-spatial processes that have recently become nodal in the discourse on consumption. The prosumption process[9] is a participative instance of transformational engagement. It concerns an intimate intertwining of consumption and production processes that, as posited by George Ritzer, always interpenetrate and no longer appear "as either pure production (without at least some consumption) or pure consumption (without at

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[6] Manfredo Manfredini, Tian Xin, and Ross Jenner, "Transductive urbanism: A method for the analysis of the relational infrastructure of malled metropolitan centres in Auckland, New Zealand," *Athens Journal of Architecture,* 3, n. 4 (2017): 411-440, available at: https://www.athensjournals.gr/aja; Manfredo Manfredini, and Ross Jenner, "The Virtual Public Thing: De-re-territorialisations of public space through shopping in Auckland's urban space," *Interstices: Journal of Architecture and Related Arts*, 16 (2015): 70-81.
[7] Peter Herrle, Josefine Fokdal, and Detlev Ipsen, *Beyond Urbanism: Urban (izing) Villages and the Mega-Urban Landscape in the Pearl River Delta in China* (Zűrich: Lit, 2014); Richard Sennett, "The Open City," *Urban Age* (Berlin, 2006), available at http://www.urban-age.net; Michael Dear and Steven Flusty, "Postmodern Urbanism," *Annals of the Association of American Geographers* 88, n. 1 (1998): 50-72; Soja, Edward. "Regional Urbanization and the End of the Metropolis Era," in *The New Blackwell Companion to the City*, ed. Gary Bridge and Sophie Watson (Malden, MA and Oxford: Wiley-Blackwell, 2011), 679-689.
[8] Fredric Jameson, *Postmodernism, or the Cultural Logic of Late Capitalism* (London: Verso, 1990); Mark Featherstone, *Planet Utopia: Utopia, Dystopia, Globalisation* (London: Routledge, 2017); Neville Mars, and Adrian Hornsby, *The Chinese Dream: A Society under Construction* (Rotterdam: 010 Publishers, 2008).
[9] George Ritzer and Nathan Jurgenson, "Production, Consumption, Prosumption: The Nature of Capitalism in the Age of the Digital 'Prosumer'," *Journal of Consumer Culture* 10, n. 1 (2010): 13-36; George Ritzer, "Prosumer Capitalism," *The Sociological Quarterly* 56 (2015): 413-445.

least some production)."[10] It empowers people by giving them some control over what they consume, involving them in multiple nuances of consumerist and productive processes.[11] For the strong impulse received by digital technology, prosumption emerges in advanced forms in the technologically enhanced meta-public realms. The spatial transduction process[12] is an experiential instance of switching between alternative realms with different contextual references. It has the capacity to bring across realms of ambiguous and ambivalent double forms of real, semi-real and hyper-real (e.g. with forms of theming that stage local culture). Transductive instances are not permanent but temporal and based on dynamic, reiterative and transformative mechanisms. Their activation relies on multifarious technologies that produce sensorial and cognitive effects, combining analogue (e.g., themed material decoration) and digital (e.g., immersive virtual reality) means. For the power given by digital tools to these conversion mechanisms, the hyper-mediated atmospheres of the meta-public realms catalyses spatial transduction processes, continuously producing heterotopic spatialities that, as Bruno Latour described in his *Invisible City*, *incarnate* the *dispersed plasma* of hard urban reality and electronic utopias.[13]

The prosumption and transduction processes have found in the meta-public mall environments an ideal laboratory for combinatory experimentations and have contributed to the profound transformation of their physical and social infrastructures as well as their semantic representational constructs. The most obvious of these transformations is typo-morphological: the monolithic, large, closed, urban element that distinguished the architecture of the modern mall in its earlier stage has increased its size and fragmentation, to assume the complex form of a discrete part of the city – its central core. Its utmost transduction is, indeed, the production of a pseudo-urbanity[14] that at the same time emulates and displaces the centre. It is a pseudo-urbanity of an implanted core that, while acting independently from the city, operates as a prosthetic organ of the urban body. The way it reproduces the functions and actions of traditional city cores is by mirroring its form, structure, operations, image and meaning. With regard to its urban structure, this core is organised as a hierarchical assemblage of composed heterogeneity, with a primary infrastructure reduplicating idealised networks of plazas, streets and lanes. It is a structure of optimised capillarity connecting homogeneous functional precincts and anchored on primary nodes, such as department stores, which take the place of civic institutions, such as theatres. Functionally, this core has an all-encompassing programme that virtually include all the activities of the service sector: from retail to hospitality, from financial to personal

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[10] George Ritzer, "Prosumption: Evolution, Revolution, or Eternal Return of the Same?" *Journal of Consumer Culture*, 14, n. 1 (2013): 10.

[11] Ritzer and Jurgenson, "Production, Consumption, Prosumption," 13-36; Ritzer, "Prosumer Capitalism," 413-445.

[12] Hagberg and Styhre, "The Production of Social Space," 354-374; Rob Kitchin and Martin Dodge, *Code/Space: Software and Everyday Life* (Cambridge, MA: MIT Press, 2011).

[13] Bruno Latour and Emilie Hermant, *Paris Ville Invisible* (Paris: La Découverte-Les Empêcheurs de Penser en Rond, 1998).

[14] Nicholas Jewell, "Eastern Promises," in *The Shopping Centre, 1943-2013: The Rise and Demise of a Ubiquitous Collective Architecture,* ed. Janina Gosseye and Tom Avermaete **(**Delft, The Netherlands: Delft University of Technology, 2015**)**, 15-29.

services, from information technology to education and health. Genuine public institutions, such as libraries and citizens advice bureaus, are also integral part of its prosumerist offering. Semantically, the narrative construct is consistently expressed throughout all morphological, material, decorative and naming levels. Particularly indicative of the latter, is the frequent designation of its central places as *civic plazas*, *town centre squares* and *streets* (Figure 1 and 2).

A peculiar type of introverted pattern distinguishes spatially the new self-reliant, independent urban organ: the ambivalent relationship between interior and exterior.[15] The dual identification of clear inside and outside conditions, challenges one of the primary topological criteria of the urban structure it intends to mirror. Its key open "public" spaces epitomises this characteristic: the central plaza is an inside of an inside (the mall) and an outside of an outside (the civic public space proper) which is at the same time the space of highest indexicality and richness in contextual references, as well as the place of departure of the most internalised looping patterns and entrenched connectors. These juxtaposed landscapes produce transformative atmospheres of redoubling and repetition of the different, continuously reorganising their spatialities. To describe this wavering topology we can use a comment by Gilles Deleuze on Foucault's work where he articulated a way of describing forces able to place the immanence (inside) as always other (outside): "the outside is not a fixed limit but a moving matter animated by peristaltic movements, folds and foldings that together make up an inside: they are not something other than the outside, but precisely the inside *of* the outside".[16]

Figure 1. Directional street sign in Botany Town Centre, one of the "civic malls" of Auckland, New Zealand. © Manfredo Manfredini, 2015.

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[15] Fredric Jameson and Michael Speaks, "Envelopes and Enclaves: The Space of Post-Civil Society," *Assemblage*, n. 17 (1990): 35.
[16] Gilles Deleuze, *Foucault* (London: Continuum, 1999), 80.

The ambivalence also destabilises the simple spatial inversion that characterised the previous mall types. In the new malls there is no place for the "reversed worlds" that Kim Dovey described as places where the combination of syntactic and semantic inversions instituted a threshold shifting the rules of the game, transforming the functional shopping into gratifying lifestyle, and permanently suspending it in hyperreality.[17] In the new mall, the boundaries of these spaces continuously reverse and invert the quality of the territories they separate, making their interiors and exteriors coextensive, superimposing the homogenised, distanced and imagined realities of *isotopia*, *heterotopia*, and *utopia*.[18]

Figure 2. Civic Square signage and fountain on the third floor of the Union Square megablock (>1 million square metres of floor space) in Kowloon, Hong Kong. © Luo Wen, 2017.

1. Framing the socio-spatial condition of meta-public space

Since the appearance of modern shopping centres, the relationship between conception (planning, implementation and management) and experience (perception and everyday life routines and actions) has been central to the urban discourse. Particularly relevant, in the literature on the recent development of cities, is the growing standing of spaces of consumption in social, spatial, cultural and legal fields.[19]

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[17] Kim Dovey, *Framing Places: Mediating Power in Built Form* (New York: Routledge, 1999), 123-138.

[18] Henri Lefebvre, *The Production of Space* (Oxford: Blackwell, 1991), 163-164.

[19] Daniel Moeckli, *Exclusion from Public Space: A Comparative Constitutional Analysis* (Cambridge: Cambridge University Press, 2016); Steven Miles, *Spaces for Consumption: Pleasure and Placelessness in the Post-Industrial City* (Los Angeles: Sage, 2010); Mattias Kärrholm, *Retailising Space: Architecture, Retail and the Territorialisation of Public Space* (Farnham, Surrey: Ashgate, 2012); Stephen Carr, *Public Space* (Cambridge: Cambridge University Press, 1992); Sorkin Michael, ed., *Variations on a Theme Park: The New American City and the End of Public Space* (New York: Hill and Wang, 1992); Pauline Maclaran and Stephen Brown, "The Center Cannot Hold: Consuming the Utopian Marketplace," *Journal of Consumer Research* 32, n. 2 (2005): 311-323; Don Mitchell, "The End of Public Space? People's Park, Definitions of the Public, and Democracy," *Annals of the Association of American Geographers* 85, n. 1 (1995): 108-133; Andrew Newman, Charles Dennis, and Shahid Zaman, "Marketing Images and Consumers' Experiences in Selling Environments," *Marketing Management Journal* 17, n. 1 (2006): 136-150; Richard Sennett, "Reflections on the Public Realm," in *A Companion to the City,* ed. Gary Bridge and Sophie Watson (Chichester: Wiley-Blackwell, 2008), 380-387.

The latest evolution of the malls discussed in this paper has importantly contributed to this expansion since it has exacerbated some of the main criticalities of the previous types: the segmentation of public space and the polarisation of social infrastructure in fragmented locales either produced through *tabula rasa* urban renewal processes or unrelenting growths of unbounded fabrics of disjointed domesticities.[20] Many of these studies have focused on the effects on public life and everyday practices of the local communities of these private environments with conflated and polarised urban amenities.[21] Links between privatisation and commercialisation of public space and homogenising mechanisms of social control and securitisation of these places have been examined and described. Their relation to increasing socio-spatial fragmentation of the contemporary urban society and problems affecting the wellbeing of citizens and communities, limiting inclusion, pluralism, civic engagement and relational life have been foregrounded.[22] The tension between trends of progressive sharing, or transferring, of the control of urban space with leading actors of the market economy and the everlasting effort of the civil society to reconstitute the city as a commons and integrate collaborative social ecosystem faces has been widely discussed.[23] The critical relevance of these issues in hindering communicative actions, encounter and dialogue for social development in our progressively diverse society has also been identified by the United Nations with the recent adoption of the New Urban Agenda.[24]

The substantive body of studies on the transformation of public space in urban environments dominated by modern enclosures has provided conspicuous theoretical and empirical instruments for evaluating the various aspects of their socio-spatial agency. The recent transformations that have led to what is identified here as a

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[20] Thomas Campanella, *The concrete dragon: China's urban revolution and what it means for the world* (New York: Princeton Architectural Press, 2012); Chuihua Chung et al., eds., *The Harvard Design School Guide to Shopping, Project on the City 2* (Cologne: Taschen, 2001); Peter Bloch, Nancy Ridgway, and Scott Dawson, "The Shopping Mall as Consumer Habitat," *Journal of Retailing 70*, n. 1 (1994): 23-42; Lizabeth Cohen, *A Consumers' Republic: The Politics of Mass Consumption in Postwar America* (New York: Knopf, 2003); Kimberley O'Sullivan and Manfredo Manfredini, "Sub-standard Housing and Access to Adequate Housing," in *A State of New Zealand Report for UN Habitat III*, ed. Dory Reeves, Stephen Knight Lenihan and Sandeeka Mannakkara (Auckland: The University of Auckland, 2016), 85-88.

[21] Margaret Crawford, "The World in a Shopping Mall," *Variations on a Theme Park*: 3-30; Jon Goss, "The "Magic of the Mall": An Analysis of Form, Function, and Meaning in the Contemporary Retail Built Environment," *Annals of the Association of American Geographers 83*, n. 1 (1993): 18-47.

[22] Setha Low and Neil Smith, *The Politics of Public Space* (New York: Routledge, 2006); Adam Crawford, ed., "From the Shopping Mall to the Street Corner: Dynamics of Exclusion in the Governance of Public Space," *International and Comparative Criminal Justice and Urban Governance* (Cambridge: Cambridge University Press, 2011), 483-518;
Margaret Kohn, *Brave New Neighborhoods: The Privatization of Public Space* (New York: Routledge, 2004). Hugh Matthews, Mark Taylor, Barry Percy-Smith, and Limb Melanie, "The Unacceptable 'Flaneur': The Shopping Mall as a Teenage Hangout," *Childhood 7*, n. 3 (2000): 279-294; Anna Minton, "Ground Control," *Arena Magazine (Fitzroy, Vic)* 119, Aug/Sept (2012): 34-37. Hopkins, "West Edmonton Mall," 268-279; Malcolm Voyce, "Shopping Malls in Australia: The end of Public Space and the Rise of Consumerist Citizenship?," *Journal of Sociology 42*, n. 3 (2006): 269-286; Sharon Zukin, "Urban Lifestyles: Diversity and Standardisation in Spaces of Consumption," *Urban Studies 35*, n. 5-6 (1998): 825-839.

[23] David Harvey, "From Managerialism to Entrepreneurialism: The Transformation in Urban Governance in Late Capitalism," *Geografiska Annaler: Series B, Human Geography 71* (1989): 3-17; Stuart Hodkinson, "The New Urban Enclosures," *City 6* (2012): 500-518.

[24] United Nations, *"New Urban Agenda."*

condition of meta-publicness have, however, been only partially addressed in the field of urbanism. Studies on the spatial contribution that involves the re-politicisation of people's actions in spaces dominated by the processes framed here as transduction and prosumption, are particularly scarce and fragmentarily cover the socio-spatial problems.[25] Two main aspects of a major recent concept, experientiality, adopted in mall planning and management, will be developed here at some length. First, the role of eventful spectacularised environments in these hyper-mediated depoliticised spaces. Second, the re-politicising agency of the hyper-mediated connectedness of these spaces.

1.1 *The interactive environmental eventfulness of the meta-public space: From*
    consumer of commodity fairgrounds to prosumer of experiential kaleidoscopes.
In the second part of the last century, shopping centres were the contexts in which the critique of contemporary problems in the relations between sociability and political spheres identified the highest crisis of public space. The problems of the decay of the public realm originally ascribed to the consumerist *distribution factories* [26] that originated in the 19th century department store,[27] have been recognised in their exacerbation in the major modern centres of shopping where the *society of the spectacle*[28] had its main expression. There, highly innovative spatial experiments had de-differentiated the forms of consumption and inhibited the traditional forms of production and interaction of the individual in public space. These places resulted from an extreme rationalisation process to maximise efficiency, control, predictability and calculability of commercial operations while encouraging consumers' everyday spending behaviours with impressive *fairground spectacles of commodities*[29] in hedonic atmospheres *akin to holiday destinations.*[30]
Today, fifty years after the publication of Guy Debord's seminal critique of the *The Society of the Spectacle*, the character of these spaces has shifted from the consumerist hedonic to the post-consumerist experiential.[31] This has developed the fundamental ambivalence of prosumption into a force that, somewhat paradoxically, debilitates the consolidated substantive spectacular depoliticisation. In the last generation of malls, the very same forces that commercialised and made prime commodity of social, recreational and seductive values,[32] strove actively to engage consumers in co-creative

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[25] Janina Gosseye, Tom Avermaete, and Bruno De Meulder, eds., *Acculturating the Shopping Centre* (Abingdon, UK: Taylor and Francis, forthcoming); Rob Kitchin, and Martin Dodge, "Placing' Cyberspace: Geography, Community and Identity," *Information Technology, Education and Society* 16, n. 1 (2015): 23-43; Hagberg and Styhre, "The Production of Social Space," 354-374.

[26] Guy Debord, *The Society of the Spectacle* (New York: Zone Books, 1994), 62.

[27] Richard Sennett, *The Fall of Public Man* (New York: Knopf, 1977).

[28] Debord, *The Society of the Spectacle.*

[29] Jean Baudrillard, *The Consumer Society* (London: Sage, 1998), 28.

[30] Bryman, *The Disneyization of Society*, 58.

[31] Joseph Alba and Elanor Williams, "Pleasure Principles: A Review of Research on Hedonic Consumption," *Journal of Consumer Psychology* 23, n. 1 (2013): 2-18; Joseph Pine and James Gilmore, *The Experience Economy* (Boston: Harvard Business School Press, 1999).

[32] Shaked Gilboa, Iris Vilnai-Yavetz, and Jean Charles Chebat, "Capturing the Multiple Facets of Mall Experience: Developing and Validating a Scale," *Journal of Consumer Behaviour* 15, (2016): 48-59.

and digitally supported dynamics that progressively democratised and combined the production and consumption of the spectacle.

To interpret how this ambivalence includes forms of re-politicisation of the individual, guidance can be found in the body of literature on the modern destabilisation of traditional processes in contemporary cities. These studies have focused on the transformation of the interaction between individuals and their environment, shedding light on the processes of identification and attribution of meanings and values to places through the combination of personal and collective conceived, perceived and lived practices.[33] Their attention to relational actions and practices provides insights for the study of this entangled condition of *malled* space, offering conceptual instruments to interpret the evolution of the public-private relations,[34] articulating aspects of form and experience from the perspective of the consumer.

The tradition of studies hinging on the seminal work of Hannah Arendt is particularly relevant, as it addresses problems of the private seizure of publicness and articulates them in the critique of the loss of "agonistic pluralism."[35] Her studies underline the relevance of socio-spatial conditions that support the complex formation of what she defines as *collective worlds*. These worlds are intended as permanent institutions – in her words a *community of things* – able to gather together and relate individuals in material space to substantiate and guarantee the development of culture and democratic systems. Arendt observes that their disappearance in modern society has led to the atrophy of political life. This is a process of occlusion of the political, where the pervasion of production and consumption logics blurs the distinction between the private and the public. She notes the transformation of public space into a *pseudospace of interaction* where individuals "no longer 'act' but 'merely behave' as economic producers, consumers and urban city dwellers."[36] The critique of the reduction of publicness to a sphere of passive cultural consumption was importantly expanded by Jürgen Habermas. Although from a different position, he argued that the power given to private actors – particularly the corporate ones – by modern audio-visual mass media supported their *re-feudalisation* of the modern public sphere. Entertainment and advertising replaced public discourse, obstructing practices of rational-critical discourse

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[33] Michel de Certeau, *The Practice of Everyday Life* (University of California Press: Berkeley, 1984); Thomas Gieryn, "A Space for Place in Sociology," *Annual Review of Sociology* 26 (2001): 493-496; Richard Stedman, "Is it Really Just a Social Construction? The Contribution of the Physical Environment to Sense of Place," *Society & Natural Resources An International Journal* 16, n. 8 (2003): 671-685; Yi-Fu Tuan, *Space and Place: The Perspective of Experience* (London: Edward Arnold, 1977); Richard Wohl and Anselm Strauss, "Symbolic Representation and the Urban Milieu," *American Journal of Sociology* 63, n. 5 (1958): 523-532; Henri Lefebvre, *Rhythmanalysis: Space, Time and Everyday Life* (New York: Continuum, 2004); *Critique of Everyday Life* II: *Foundations for a Sociology of the Everyday* (London: Verso, 2002).
[34] Jeff Weintraub and Krishan Kumar, *Public and Private in Thought and Practice: Perspectives on a Grand Dichotomy* (Chicago: University of Chicago Press, 1997).
[35] Hannah Arendt, *The Human Condition* (Chicago: University of Chicago Press, 1958); Lynn Staeheli and Don Mitchell, "USA's Destiny?"; Chantal Mouffe, "Public Space and Democratic Politics," *Laps* (2007): 1-10.
[36] Sheila Benhabib, "Models of Public Space: Hannah Arendt, the Liberal Tradition, and Jürgen Habermas," in *Habermas and the Public Sphere,* ed. Craig Calhoun (Cambridge, MA: MIT Press, 1992), 90; Arendt, *The Human Condition*.

on political matters that substantiate participative and emancipative processes.[37] His concerns about the resulting alienation and splintering of common grounds are shared, yet severely criticised, by the "agonistic" scholars who have taken a stand for a radical multiplicity and heterogeneous coexistence to produce complex blending of diversity. Observing the striated imperfection of globalisation and acknowledging the irreducibility of conflicts where "parties recognize the legitimacy of their opponents," they have claimed the fundamental role of space for the constitution[38] of pluralistic and networked realms, free from the control of dominant powers.

Figure 3. Panoramic "street view" of the interior of the main concourse of Sylvia Park, Auckland, the largest shopping mall in New Zealand. © 2017 Google.

1.2 *Experiential spaces and hyper-mediated environments*

The strategies to augment the experiential quality of space[39] include forms of eventful activation of space with synchronisation of embodied rhythms. These strategies reflect the emphasis on improving user experience that has recently penetrated and become an imperative in the agenda of all levels of spatial governance to amplify the attractiveness of places. Commercial environments, and more specifically malls, have been at the forefront of this trend. They have implemented these strategies with multiple tactics to produce ever different experiences with engaging, emotional,

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[37] Craig Calhoun, "Introduction: Habermas and the Public Sphere," in Calhoun, *Habermas and the Public Sphere*; Jürgen Habermas, *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society* (Cambridge, MA: MIT Press, 1989); "Further Reflections on the Public Sphere," in Calhoun, *Habermas and the Public Sphere*; Jürgen Habermas and Thomas McCarthy, "Hannah Arendt's Communications Concept of Power," *Social Research* 44 (1977): 3-24.

[38] Chantal Mouffe, *The Democratic Paradox* (London: Verso, 2000); Chantal Mouffe, "Space, Hegemony and Radical Critique," in *Spatial Politics: Essays for Doreen Massey*, ed. David Featherstone and Joe Painter (London: Wiley, 2013), 22-31.

[39] Barry Babin, William Darden, and Mitch Griffin, "Work and/or Fun: Measuring Hedonic and Utilitarian Shopping Value," *Journal of Consumer Research* 20, n. 4 (1994): 644-656; Adam Lindgreen, Joëlle Vanhamme, and Michael Beverland, eds., *Memorable Customer Experiences: A Research Anthology* (Farnham: *Gower, 2009);* Michael Jones, Kirsty Reynolds, and Mark Arnold, "Hedonic and Utilitarian Shopping Value: Investigating Differential Effects on Retail Outcomes," *Journal of Business Research* 59, n. 9 (2006): 974-981; Joseph Pine II and James Gilmore, "Welcome to the Experience Economy," *Harvard Business Review* 76 (July 1998): 97-105.

coherent and cognitively important features. They include both permanent and occasional events with unlimited diversification, including such things as pop-up shows, recurrent festivals, exotic sportainment and touring opportunities (e.g., indoor sky-diving, ice skating, "immersive" aquarium strolling and balloon rides), which integrate mechanisms to induce and control behaviours, and coordinate emotional drivers, such as belonging, excitement and enjoyment, as well as bodily rhythms, such as those related to movement, fatigue and hunger.

The interpretation of the socio-spatial effects of the enhanced differentiation in these eventful systems is illuminated by the Lefebvrian critique of space as an ontogenetic and permanently integrated multidimensional realm.[40] This approach to socio-spatial transitions is particularly useful to understand the progressively specialised and fragmented urban conditions. It focuses on the forces behind them, deploying a complex analysis to distinguish the different forces in their unbalanced power relations and unified play. The agency of dominating powers located outside the local socio-spatial fields of their production of physical, cognitive and social space is critically studied and the logics that underlie the governance of complex apparatuses, where collective control is minimised, are revealed.

To explain the peculiar impact on perceptual, cognitive and enactive abilities of the users of these apparatuses, Henry Lefebvre articulated a multidimensional instrument distinguishing conceived, perceived and lived spatialised relations. This specifically disentangles the complex strategies deployed to produce spaces to be perceived as differential by controlling powers through specific historic and geographic processes. He defined these as *abstract spaces*, to underline the abstraction used by these powers to establish and perpetuate their hierarchical systems, thereby assigning special status to particular organisations and places, and at the same time stipulating various forms of exclusion. To implement abstraction, a particular law[41] of homogenisation is adopted: the obliteration and flattening of differences that hinder external control. Yet, to function effectively, staged *induced differentiation* is abundantly used to compensate for the flaws of the diminished real.

The pseudo-urbanities are produced by dissimulative transduction processes that deliberately induce, as Lefebvre claimed, false consciousness. The pseudo-differential abstraction, with masked reduplications, functionalises symbols to activate the power of metaphor and myth to produce spectacles staging illusory full realms of plenitude.[42] This has a quasi-magical power to instigate "marvellous self-deceptions"[43] that reduce the collective capacity to distinguish genuine references in the processes of

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[40] Lefebvre, *The Production of Space*; *The Urban Revolution* (Minneapolis: University of Minnesota Press, 2003); *Critique of Everyday Life* I, (1991); *Writings on Cities* (Cambridge: Blackwell, 1996); *Everyday Life in the Modern World* (New Brunswick, NJ: Transaction Books, 2003); *David Harvey, "From Space to Place and Back Again: Reflections on the Condition of Post Modernity," in Mapping the Futures: Local Cultures, Global Change*, ed. Jon Bird et al. (London: Routledge, 1993), 3-29; *Edward Soja, Thirdspace: Journeys to Los Angeles and Other Real-and-Imagined Places (Cambridge, MA: Blackwell, 1996); Postmodern Geographies: The Reassertion of Space in Critical Social Theory* (London: Verso, 1989); *Mark* Purcell, "Excavating Lefebvre: The Right to the City and Its Urban Politics of the Inhabitant," *GeoJournal* 58, n. 2 (2002), 99-10.
[41] Lefebvre, *The Production of Space*, 372.
[42] Lefebvre, *The Production of Space*, 28.
[43] Lefebvre, *The Production of Space*, 189.

identification, distinction, naming, recognition, connection and ownership of places. This threatens traditional developments of collective forms of interpretation, elaboration and development of experiences of places that constitute identity and a sense of belonging, substantiating personal and communal biographies and narratives.[44] Jon Goss has described these places as *dreamhouses of the collectivity*: repositories of cultural images of utopia that mirror a regime in which "the collective dream of authentic life is not expressed in the political process but is distorted by ideology and harnessed to commodity consumption."[45] There, where the marvel hinges on perceived hyperspatial authenticity, multiple simulations transform the real into represented pseudo-utopias/heterotopias of compensation, such as in the private boudoirs or jewellery ambiences of certain chains of coffee shops. The marvel of this deception includes the social dimension, where virtual and augmented reality support personal relations, merging face-to-face and remote interaction in both synchronous, semi-synchronous and asynchronous ways.

Specific to the digital age is the augmentation that has made the mall-dreamhouses transformative, both in scale and quality, to cater for the different needs and desires of communities, groups and the individual. This is made possible through the creation of hyper-mediated environments that personalise their features and support, simultaneously, different forms of place-based relationality. Hyper-mediated environments create unprecedented spatial multiplicity. They are an augmented form of Foucauldian *heterotopias of juxtaposition* that simultaneously places "in a single real place several spaces [of] several emplacements that are in themselves incompatible.[46] Their equipment, with enhanced and high-performance digital infrastructure and services (e.g., interactive physical interfaces and virtual shopping assistants), provides real-time spatial tuning that spans from micro to macro scale, from personal to collective, providing multiple accesses to spatialities that range from the simultaneous to the asynchronous and from augmented to the virtual.[47] Unconditionally enabling creation and access from any time and place, these spaces irrupt into the traditional spatio-temporal flows, enabling everyday practices to engage with another particular form of Foucault's *other places*: the heterotopia of illusion. This is the place in which normalisation leaves space to its opposite: subversion, heterogeneity and excess.[48] As hyper-mediated illusionary juxtaposing heterotopias, the civic malls have a particular role in the re-politicisation of the individual. With the implementation of multiple locative and augmented reality applications, they have become prime urban places for the embodiment of the digital sphere. This process of bringing back to place and

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[44] Peter J. M. Nas, "The Urban Anthropologist as 'Flâneur': The Symbolic Pattern of Indonesian Cities," *Wakana* 14, n. 2 (2012): 429-454; Sharon Zukin, *Naked City: The Death and Life of Authentic Urban Places* (Oxford: Oxford University Press, 2009).

[45] Jon Goss, "Once-upon-a-Time in the Commodity World: An Unofficial Guide to Mall of America," *Annals of the Association of American Geographers* 89, n. 1 (1999): 45.

[46] Michel Foucault, "Of Other Spaces," in Dehaene and De Cauter, *Heterotopia and the City*, 13-29.

[47] Richard Coyne, *The Tuning of Place: Sociable Spaces and Pervasive Digital Media* (Cambridge, MA: MIT Press, 2010); Charles Soukup, "The Postmodern Ethnographic Flaneur and the Study of Hypermediated Everyday Life," *Journal of Contemporary Ethnography* 42 (2012): 226-254. *Exploring Screen Culture via Apple's Mobile Devices: Life Through the Looking Glass* (Lanham: Lexington Books, 2016).

[48] Foucault, "Of Other Spaces," 13-29.

rooting the space of flow[49] has reinforced their civil ambivalence as central nodes: while the external organisations that own, manage and control these urban elements increase their predominance, the juxtaposition logic of this digitally augmented intensification of socio-spatial polarisation enables the simultaneous presence and centralisation of antagonist realms composed by autonomous individuals and grassroots organisations. These antagonist realms can include, given the illusionary logic, realms of subversion and heterogeneity[50] that, in Lefebvrian terms, act in contention with the abstract, minimal and induced differentiation to establish a qualitative, productive and maximal difference.

Concerning the spatial hegemony of the commercial organisations of the malls, hyper-mediation increases their potential, stabilising and reinforcing their dominant position. The digital environment enables the widening of the traditional applied logics of anchoring that underlie the conception of these developments. The implemented capability expands the traditional applied strategies of communication with locative, omnichannel and multimedial digital means, which magnify the tactics based on branding, bricks and mortar theming, "cappuccino pacification"[51] and *son et lumière* distraction.[52] The holding power of the anchors has been expanded with enhanced marketing instruments to cope with the new prosumer-led market that is more and more pervaded by the online component (e.g., the *ad hoc* integrated on- and off-line solutions created by dedicated branches of marketing departments, research laboratories and think tanks, such as the recently created Westfield Retail Solution centre). This has enhanced their category-killer effect, since local competitors cannot afford to deploy the required resources.

The digital augmentation primacy of the malls includes an extra support to the Internet-of-Things, with mobile applications that enhance information flows, spatial intelligibility and accessibility, social interaction and gaming. The overabundant and continuously updated availability of information and data on proprietary and global media services elicits co-production of hybrid spatialities merging material and virtual contents. The array of locative and real-time mobile services with personalised interfaces and push notifications provides unconstrained visibility and accessibility of things. This includes applications that are dedicated-proprietary, such as the "discover more to love" Westfield Shopping AU, or hybrid, such as the new online-to-offline retail Meituan-Dianping (China's largest provider of on-demand services), or global, such as Forsquares and Google. The integrated system of services connecting multiple fixed physical interfaces, such as interactive monitors, with visitor's mobile devices enhances spatial perception, navigation and discovery. This includes, for example,

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[49] Manuel Castells, "The Rise of the Network Society," *The Information Age: Economy, Society and Culture* I (Oxford: Blackwell, 1996).

[50] Manfredo Manfredini, and Anh-Dung Ta, Co-Creative Urbanism: The production of plural evolutionary spatialities through conflicts and complicities between public and private in the streets of Hanoi, Vietnam," *Joelho, Journal of Architectural Culture*, 7 (2016): 110-131; Manfredo Manfredini, and Farzad Zamani Gharaghooshi, "Instances of Emerging Agonistic Spatialities in the Contemporary City: The Production of Differential Geographies in the Public Space of Istanbul," in *Contemporary Urban Issues*, ed. Hande Tulum (Istanbul: Dakam Publishing), 501-513.

[51] Sharon Zukin, *The Cultures of Cities* (Oxford: Blackwell, 1995), 28.

[52] Crawford, "The World in a Shopping Mall," 3-30; Goss, "The 'Magic of the Mal'," 18-47.

micro GPS navigation (e.g., Google Maps has full coverage of mall interiors, with Street View panoramas; Figure 3 amd 4a) and augmented reality discovery (e.g., World Around Me and, shortly, Google Lens show directions, distances and webpage links to nearby point of interests, such as shops, restaurants and public transport stops; Figure 4b). The heightened effectivity of social "radar" applications favours meeting or making new friends. This higher potential for new encounters in mall environments, through locative social search mobile applications, is generated by their very high network effects (elements such as perceived high safety of their highly policed spaces also contribute to it, as revealed by research on users of dating applications). The high concentration of networks and nodes of locative interactive games (e.g., the density of *Gyms* and *Stops* of Niantic's Pokémon Go AR application; Figure 4c) has malls as foremost sites of digital gaming in public space.

With regard to the antagonist realms of autonomous individuals and grassroots organisations that these digital augmentations have reactivated, the hyper-mediation has reintroduced their action in the production of multiple spatialities in the malls and, with it, brought into being a *differential space*. This is mainly due to the support given to prosumption practices that through digital embodiments have a place in the production of maximal difference, accessing domains that were previously exclusive to the external abstractive forces. These practices have a powerful agency to take back to the locale the control of some of the transduction processes responsible for the socio-spatial deterritorialisation and reterritorialisation. They have rehabilitated collective processes of spatial ontogenesis that actively shape and appropriate places of free socio-spatial association. They have re-embodied realms otherwise present only in de-spatialised flows of the hyperspace.

The re-embedment of antagonist realms counters the condition of displacement typical of the older malls; a condition that, as Jameson pointed out, transcends "the capacities of the individual human body to locate itself, to organize its immediate surroundings perceptually, and cognitively to map its position in a mappable external world."[53] This occurs because the spatial hybridity produced by the mobile digital pervasion[54] opens the mall to forms of independent access through multiple channels and layers of communication of the augmented atmospheres.[55] As a result, actors, scenes and operations of both the material and immaterial sphere are permanently mobilised, re-networked and re-established[56] in a tension between abstractive and differential forces

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[53] Fredric Jameson, *Postmodernism, or, the Cultural Logic of Late Capitalism* (Durham: Duke UP, 1991): 83.
[54] Adriana de Souza e Silva, "From Cyber to Hybrid: Mobile Technologies as Interfaces of Hybrid Spaces," *Space and Culture* 9, n. 3 (2006): 261-278; Alan McKeon, "Using Social Media Insights to Drive Shopper Engagement at the Mall", *Retail Property Insights* 21, n. 2 (2015): 13-14; Jerry Kang and Dana Cuff, "Pervasive Computing: Embedding the Public Sphere," *Washington and Lee Law Review,* 62 (2005): 93-146.
[55] Adriana de Souza e Silva and Jordan Frith, "Locative Mobile Social Networks: Mapping Communication and Location in Urban Spaces", *Mobilities* 5, n. 4 (2010): 485-505; Keith Hampton, "The Social Life of Wireless Urban Spaces: Internet Use, Social Networks, and the Public Realm," *Journal of Communication* 60, n. 4 (2010): 701-722.
[56] Kitchin and Martin, *Code/space*; Rob Kitchin and Sung-Yueh Perng, *Code and the City* (London: Routledge, 2016); Rob Kitchin and Martin Dodge, "Code and the Transduction of Space," *Annals of the Association of American Geographers* 95, n. 1 (2005):162-180.

growing within the system that used to deliver conditions silencing individuals and making them unable to adopt critical stances.[57]

Figure 4. Augmented reality mobile applications for a) navigation (Google's Google Map Street View ©), b) discovery (WT InfoTech's World Around Me ©) and c) gaming (Niantic's Pokémon GO) in the Centre Court of Sylvia Park mall. © Angelo Bueno and Tanyalak Chalermtip, 2017.

2. Towards ambiguous territorialities

Interpreting the meta-publicness of the new civic megamall as a combination of the ambivalences in socioeconomic (augmented prosumption) and socio-spatial (augmented transduction) relations, the question of the effectiveness of its political agency arises. The core of the question is whether this condition has an impact on the *quality of life for all*, improving the limits of accessibility and inclusion that have characterised the pseudo-interaction of the quasi-publicness of the other mall types. A peculiar characteristic of meta-publicness is its openness and capacity to make permeable and productive the boundaries between the territories controlled by various actors. The openness of territories recombines the forms of their identification, appropriation and association, disempowering the dominating external forces and empowering the locale. In Lefebvrian terms, this new condition strengthens differential and distinctive forces over the abstractive and homogenising ones, making difference emerge. The difference, as continuous proliferation and transformation of territories, is granted by prosumerist-transductive augmentations that give form to modern heterotopias of juxtaposition and illusion. The difference emerges from effectively engaged people in multiple socio-spatially networked contexts[58] supported by spatial embodiments of the digital public sphere through mediations and interconnections of material and virtual platforms and communication flows. The

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[57] Lefebvre, *The Production of Space*, 287.
[58] Cynthia Susilo and Bruno De Meulder, "The Boulevard Commercial Project of Manado, Indonesia: Trickled-down Globalization Versus a Catalyzed Super Local," in *The Shopping Centre, 1943-2013: The Rise and Demise of a Ubiquitous Collective Architecture,* ed. Janina Gosseye and Tom Avermaete (Delft: Delft University of Technology, 2015), 41-55.

difference is framed in the continuous hybridisation across the entire spectrum of the social, cultural and spatial domains that, as Mubi Brighenti posited,[59] produce complex territorialities made of fields in steady reproduction, unpredictable multiplication and interpenetration.

An example of this differentiation in these meta-public, transductory and prosumerist spaces is the blurring of information flows on digital social media. There, communication transitions seamlessly between areas controlled by the external dominating powers and the pluralistic networks of grassroots organisations and autonomous individuals. This phenomenon, which has undermined the one-way relationship of the flows between the dominating power and the isolated individuals, distinguishes the new meta-public space from the preceding quasi-public. It has strengthened participation and engagement in the public sphere, enabling autonomous individual expression through multimodal means, including media interlinking multiple platforms (e.g., between the public and private parts of a social networking service, such as Facebook, and/or photo-sharing application, such as Instagram, using reposting practices). This has enhanced participation and engagement in an unprecedented inclusionary process, granting access to the *other*, the marginalised and the "dangerous giants"[60] that have "the capacity to disrupt and destroy the material and digital structures in which they find themselves."[61]

Handheld devices, the prime and often the only access to the public sphere while in public spaces, epitomise this phenomenon. They can make un-private[62] each individual's actual or archived act, idea and perception using multiple media and channels enabling the regulation of temporal (e.g., with real-time streaming), thematic (e.g., with advanced bookmarking and tagging) and authorial (e.g., with semi-anonymous identification) attributes in public communication. This de-privatisation is facilitated by the augmentation of spatialities of sheer consumption that – as described by Lefebvre[63] – have acquired the power of mirror and mirage through the "logic of visualisation," immersing individuals in representations of the publicness that are at once true and false. The disappearance of the *reality principle*[64] in contemporary "[obscene] ecstasy of communication" favours a reverse pervasion of the public into the private, with users enabled to claim public spaces in their private ones.

The transitional condition between opposing spatialities, though, is highly problematic and matches the one that Sharon Zukin defined as socially liminal: an ambiguous and ambivalent condition that complicates the constructions of spatial identity.[65] The way it counters the abstractive forces within the existing geographies of power is subject to a

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[59] Andrea Mubi *Brighenti*, "*Mobilizing Territories*, Territorializing Mobilities," *Sociologica* 8, n. 1 (2014).

[60] Erving Goffman, *Encounters* (Indianapolis: Bobbs-Merrill, 1961).

[61] Ritzer, "Prosumer Capitalism", 413-445.

[62] William Mitchell, *Me++: The Cyborg Self and the Networked City (*Cambridge, MA: MIT Press, 2003).

[63] Lefebvre, *The Production of Space*, 189.

[64] Jean Baudrillard and Arthur B. Evans. "Simulacra and Science Fiction (Simulacres et science-fiction)", *Science Fiction Studies* (1991): 309-313; Jean Baudrillard, *The Ecstasy of Communication* (New York: Semiotext(e), 1988).

[65] Sharon Zukin, *Landscapes of Power: From Detroit to Disney World* (Berkeley: University of California Press, 1991); Sharon *Zukin*, "*Postmodern Urban Landscape*: Mapping Culture and Power," in *Modernity and Identity, ed.* Scott Lash and Jonathan Friedman (Oxford: Blackwell, 1992), 221-47.

major threat posed by one of the key characteristics of its recombinant openness. This is the constitutive privateness of systems, both material and digital, that enables the impermanent, transformational dynamism of the new participative reterritorialising and reterritorialising processes. The risk that lacking public control on these new socio-spatial relational systems undermines the potential of the meta-publicness in supporting diversity, equality and inclusion is immanent in them. New processes of seizure of publicness with surreptitious colonisation by the hegemonic private organisation are high. Other sectors of the framing "sharing economy" have already been deeply affected by disruptive effects of the pervasion of the private, as several studies show.[66] This also concerns social isolation, since the compensatory effect of the new participative condition seems still very limited.[67]

An augmentation of the ambiguity between public and private character further articulates the exposure of each relational act to the monitoring and control of hegemonic external powers. While, in the digital public sphere, these risks are well known and have already led to important countermeasures, such as the restrictions of services (e.g., the recent ones regarding access to application programming interfaces of leading social media services, such as Sina Weibo and Instagram), little attention has been given to them in the augmented meta-public spaces. This is also caused by the legal status of the malls, where the complex legislative frameworks framing the public/private ambiguity of their spaces have been highly controversial and have led to protests and legal disputes, which, in a few cases, have even resulted in the statutory recognition of their publicness.[68]

Time will tell us whether the meta-publicness of *democratised spectacle*, whose traces have been found in the places of the most intense spatial, social and psychological transduction, will support the development of antagonistic decommodification forces and create spatialities of effective agonistic pluralism, or whether the intrinsic weaknesses of the systems that have supported it will permit the development of even more abstractive socio-spatial emplacements that stabilise the antagonist dominance of hegemonic actors with the hyper-spectacle of augmented and *gamified*[69] *fantasies of authentic life*[70]

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[66] Adriana de Souza e Silva, "Pokémon Go as an HRG: Mobility, Sociability, and Surveillance in Hybrid Spaces," *Mobile Media & Communication* 5, n. 1 (2016): 20-23; Ritzer, "Prosumer Capitalism," 413-445.

[67] John D. Boy and Justus Uitermark, "Reassembling the City Through Instagram," *Transactions of the Institute of British Geographers*, version of record online: 7 June 2017, doi:10.1111/tran.12185.

[68] Anna Minton, *Ground Control: Fear and Happiness in the Twenty-first-Century City* (London: Penguin, 2012); Kohn, *Brave New Neighborhoods*.

[69] Eric J. Arnould, Linda L. Price, and Patrick Tierney, "Communicative Staging of the Wilderness Servicescape," *Service Industries Journal* 8, n. 3 (1998): 90-115; Michel Foucault, *Discipline and Punish: The Birth of the Prison* (New York: Pantheon Books, 1977), 8; Sebastian Deterding, Dan Dixon, Rilla Khaled, and Lennart Nacke, "From Game Design Elements to Gamefulness: Defining Gamification," in *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments* (2011, ACM), 9-15; Kai Huotari and Juho Hamari, "Defining Gamification: A Service Marketing Perspective," in *Proceedings of the 16th International Academic MindTrek Conference* (2012, ACM), 17-22.

[70] Goss, "Once-upon-a-Time in the Commodity World," 45; Dastur Francoise, "Phenomenology of the Event: Waiting and Surprise," *Hypatia* 15 (2000): 178-189.

Acknowledgments

CHAPTER 3 - INTRODUCTION

Dynamics of territorial production in situated and community projects

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This section considers forms of collaboration in situated and community projects embedded in important spatial transformation processes in New Zealand cities. It aims to shed light on specific combinations of material and semantic aspects characterising the relation between people and their environment. Contributions focus on participative urban transformations. The essays that follow concentrate on the dynamics of territorial production of associations between multiple actors belonging both to civil society and constituted authority. Their authors were directly engaged in the processes that are reported and conceptualised, thereby offering evidence gained through direct hands-on experience. Some of the investigations use case studies that are conspicuous examples of the recent post-traumatic urban development stemming from the Canterbury earthquakes of 2010-2011. More precisely, these cases belong to the early phases of the programmes of the Christchurch recovery or the Wellington seismic prevention. The relevance of these experiences for the scope of this study lies in the unprecedented height of public engagement at local, national and international levels, a commitment reached also due to the high impact, both emotional and concrete, that affected the entire society.

The articles of this section have been collated to document projects that provide complementary contributions to the discourse on urbanism in the area that addresses contemporary problems affecting public space, social infrastructure and power relations in network developments. The common ground of authors' approaches is the use of an empirically grounded spatio-social perspective. This implies establishing an intimate relation between theoretical work and empirical practice, not only to entirely appreciate the contribution to theory of a particular phenomenon and vice versa, but, more importantly, to align the nature of the research practice to that of the studied phenomenon. This approach develops *ad-hoc* mixed research methodologies that disentangle, while maintaining associated, complex and concurrent aspects of each process's spatial production: the conceived, lived and represented dimensions.

This form of investigation on spatially situated conditions is relevant to the articulation of the discourse descending from major research traditions: firstly, from the work on space of Henry Lefebvre;[1] secondly, from *actor-network* and *assemblage* theories;[2] and, thirdly, from their related development on *territoriology*.[3] More specifically, with reference to the latter, these studies can provide important support to Andrea Brighenti's proposition that our age is facing an "unpredictable multiplication, interpenetration and ongoing production" of territories.[4] Key in the discussion are indeed the peculiar forms, dynamics and effects generated by each situated aggregation of associative systems; each form, dynamic and effect is seen as an expression of chains of relations reflecting the fundamental tension, well described by Doreen Massey,[5] between territorial grounding and relational responsiveness.

The discussion on territorial behaviours, particularly articulated by Bennett and Moore, unravels relevant patterns regarding strategies of occupation, tactics of appropriation, and effects of association and spatial control management. It focuses on the dynamics of their socio-spatial constitutive processes, documenting their progressive expansion from individual acts and actors into multidimensional assemblages of practices and apparatuses with heterochronic paces. The practices and apparatuses are analysed to elicit the irreducible specificity of each actor - or to use Latour terminology, *actant*[6] –

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[1] Henri Lefebvre, *The Critique of Everyday Life*, Volume 1, John Moore trans. (London, England: Verso, 1991); *The Production of Space* (Oxford, England: Blackwell, 1991); *Writings on cities* (Cambridge, MA: Blackwell, 1996), *The urban revolution*, R. Bononno, Trans. (Minneapolis: University of Minnesota Press, 2003), *Rhythmanalysis, Space, Time and Everyday Life* (London, England, and New York, NY: Continuum, 2004). Edward Soja, *Postmodern Geographies: The Reassertion of Space in Critical Social Theory* (London, England: Verso Press, 1989); *Postmetropolis: Critical Studies of Cities and Regions* (Oxford; Malden, Mass.: Basil Blackwell, 2000). Mark Purcell, "Excavating Lefebvre: The right to the city and its urban politics of the inhabitant," *GeoJournal*, 58, 2–3 (2002): 99–108; "Possible Worlds: Henri Lefebvre and the Right to the City," *Journal of Urban Affairs*, 36, 1 (2013): 141-154.

[2] Bruno Latour, "On recalling ANT", *Sociological Review* 46 (1998): 15-25; *Reassembling the Social: An introduction to Actor-Network-Theory* (New York: Oxford University Press, 2005). John Law, "Actor Network Theory and Material Semiotics," in *The New Blackwell Companion to Social Theory*, ed. B. S. Turner (Chichester, England: John Wiley and Sons, 2009): 141-158. Jonathan Murdoch, "The Spaces of Actor-Network Theory," *Geoforum* 29 (1998): 357–74. Gilles Deleuze and Félix Guattari, *Rhizome* (Paris: Editions de Minuit, 1976); *Anti-Oedipus*, (Minneapolis: University of Minnesota Press, 1983). Ignacio Farías and Thomas Bender, eds., *Urban Assemblages: How Actor-Network Theory Changes Urban Studies* (London: Routledge, 2010). Ben Anderson and Colin McFarlane, eds., "Assemblage and Geography," *Area* 43 (2011): 124–64. Colin McFarlane, *Learning the City: Knowledge and Translocal Assemblage* (Oxford: Wiley-Blackwell, 2011).

[3] Mattias Kärrholm, *Retailising Space: Architecture, Retail and the Territorialisation of Public Space* (Surrey, England: Ashgate, 2012). Andrea M. Brighenti, "Mobilizing Territories, Territorializing Mobilities", *Sociologica* 1 (2014): 1-16. Peter Merriman, "Human Geography Without Time-Space," *Transactions of the Institute of British Geographers* 37, n.1 (2012): 13-27

[4] Brighenti, "Mobilizing Territories, Territorializing Mobilities", 3.

[5] Doreen Massey, *World City* (Cambridge, England: Polity Press, 2007).

[6] Latour, *Reassembling the social: An introduction to actor-network-theory*, 71.

in its physical (devices, materials and objects), social (routines, bonds, alliances and conflicts) and semantic (languages, signs and representations) aspects.

The *actants* are also explored through their permanent involvement in the establishment and re-establishment of repeated and *ad hoc*, confined and translocal, tangible and intangible "chains of activation and reactivity."[7] The evaluation of effectiveness of these chains of relations centres on their capacity to shape, organise and transform the environment.

Particularly relevant in the background of this discussion is the contention on the ontogenetic capacity of space and its correlative *right to the city*[8] that results from historically specific material, conceptual and quotidian practices.[9] This is a tenet, recently adopted by the United Nations' *New Urban Agenda* for a sustainable urban development,[10] that advocates a pluralist and inclusive public sphere as an effective antidote to the progressive fragmentation of the social, cultural and environmental body of the city, only by establishing spatialities of equitable, emancipatory and *agonistic* relationships.[11] This also includes the call to provide studies and evidence of concrete instances where practices exercising the freedom to "make and remake ourselves and our cities"[12] produce substantive tangible effects for the reconstitution of the urban integrity from the "seeds" present in its own fabric.

The projects presented respond to *right to the city* call, being instances countering the homogenisation and spatio-behavioural systems of control, often instituted with citizens' complicity by leading forces of the post-consumerist society.[13] These projects oppose the progressive privatisation of socially relevant public spaces and the related commodification of life quality.[14] With the support given to multiple and often

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[7] Brighenti, "Mobilizing Territories, Territorializing Mobilities", 20.

[8] Robert Park, *On Social Control and Collective Behavior* (Chicago: University of Chicago Press, 1967): 3. Henri Lefebvre, *Writings on Cities* (Cambridge, MA: Blackwell, 1996). David Harvey, "The Right to the City", *New Left Review* 53 (2008): 23–40.

[9] Henri Lefebvre, *The Critique of Everyday Life.*

[10] United Nations, *New Urban Agenda: Quito Declaration on Sustainable Cities and Human Settlements for All*, document adopted at United Nations Conference on Housing and Sustainable Urban Development - Habitat III Quito, Ecuador, October 2016.

[11] Chantal Mouffe, "Deliberative Democracy or Agonistic Pluralism?," *Social Research 66,* n. 3 (1999): 745-758; "Public Spaces and Democratic Politics", in *Highrise–Common Ground. Art and the Amsterdam Zuidas Area*, ed. J. Boomgaard (Amsterdam: Valiz, 2008): 135-156. Dana Villa, "Postmodernism and the Public Sphere", *American Political Science Review* 86 (1992): 712–21.

[12] David Harvey, "The Right to the City", 23.

[13] Steven Miles, "The Neoliberal City and the Pro-Active Complicity of the Citizen Consumer", *Journal of Consumer Culture 12,* n. 2 (2012): 216-230.

[14] Tridib Banerjee, "The Future of Public Space: Beyond Invented Streets and Reinvented Places", *Journal of the American Planning Association* 67, n. 1 (2001): 9-24. Anna Minton, *Ground Control: Fear and Happiness in the Twenty-First Century City* (London: Penguin, 2009). Manfredo Manfredini and Ross Jenner, "The Virtual Public Thing: De-Re-Territorialisations of Public Space Through Shopping in Auckland's Urban Space", *Interstices: Journal of Architecture and Related Arts* 16 (2015): 75-81. Manfredo Manfredini, Xin Tian, Ross Jenner, and Asu Besgen, "Transductive Urbanism" A Method for the Analysis of the Relational Infrastructure of Malled Metropolitan Centres in Auckland, New Zealand,

contradictory and conflicting parties, they guarantee the direct involvement and permanent participation of all stakeholders, fostering inclusion, autonomy and social interplay. Their concurrent action in interacting networks institute mechanisms of territorial production that establish open, anti-hierarchical and participatory relational systems.

According to their characteristics, three key types of institutionalised forms of territorial production have been identified as processes triggered by events, grassroots movements and established organisations.

The first type includes large, coral public events, such as Christchurch's *Festa*, discussed by McPherson and Pretty. They are purpose-made, self-organising systems where territories are strongly appropriated, but little association is produced, due to the ephemeral nature of the events. Their spatial production relies mainly on daily tactical moves, often with low-risk ephemeral dynamics that involve multiple actors with very diverse social, cultural, economic and institutional backgrounds. These systems have typically short-term lifespans, since they are mainly conceived as temporary events of exceptional kind. They articulate forms of synchronisation with short-term rhythms of basic bodily species, such as hunger, fatigue and pace, but also of emotional kinds, such as those related to drivers, concerning a sense of belonging, accomplishment, excitement and control. Their limited duration makes them particularly suited to festive celebratory events centred on communication, with concentration in multiple simultaneous manifestations located in nodal places of easy access. These places are conceived as platforms to catalyse creative forces present in the locale and amplify their expression to widen their public reception.

The second type includes initiatives by grassroots organisations and intermediate non-governmental organisations, such as Gap Filler, discussed by Bennett and Moore. These are place-specific, incremental semi-structured systems based on processes of strong association of territories and networks. Their spatial production is based on combinations of strategic conceptions and tactical moves. Their action is triggered and led by an agency (often an existing structured organisation) and is based on constant active participation of local individuals and groups. These systems are typically based on everyday practices and pop-up/incremental dynamics with low capital investments and mid-term lifespans. They are composed by assembling small-size elements and systems of provisional or medium-term duration that are distributed throughout urban areas. They articulate forms of synchronisation with medium-term rhythms suitable for the incremental dynamics of loose voluntary associations and grassroots movements engaged in the reconstitution and recombination of vital social networks after major traumatic events. These systems are synchronised with daily and weekly routines and aligned with the rhythms of public life, relational activity, recreation, and communicative/political action of specific habitats.

The third type includes institutions created by either governmental or non-governmental organisations, such as territorial social units, like Māori organisations,

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engaged by Prendergast and Brown in their article addressing issues of New Zealand cultural communities. These institutions form stable, consolidated, sole and highly structured systems based on processes of strong association with cultural territories and networks. Their spatial production is based on strategic conceptions. Their action is typically coordinated by a leading agency (often an existing structured organisation, such as a governmental department) and aimed at constituting platforms for the participation and integration of local and foreign individuals and groups. They are composed of large-scale and permanent structures that require long-term and high-planning and management capacity. Their setup and operation, which require high capital investment, are synchronised with multiple routines of institutions, operators and the public.

Although these types of institutionalised forms of territorial production, through situated and community projects, have different stakeholders and dynamics, they complementarily contribute to a development of their socio-spatial locale that integrates cognitive, normative, and aesthetic dimensions of the lifeworld and systems paradigms. This is primarily due to the open nature of their established chains of associations and their concrete acting towards a radically democratic social model based on equality, freedom, and difference. These are organisations based on bottom-up decision-making processes, often constituted by consolidated non-governmental organisations, such as grassroots activist groups, and educational and cultural institutions, such as tertiary education establishments. Most of them have been generated by the formalisation of latent and informal agencies (both of individual and networked actors) developed either peripherally or externally to conventional governance structures. They often include structured and emergent small local networks that reach critical mass through linkages at a global level. They are aggregations that often suffer the marginalisation perpetuated by the combined effect of the downward power structures of leading authorities and pervasive economics of transnational organisations, as described by Sharon Zukin in *Landscape of Power*[15] and Steven and Malcolm Miles's *Consuming Cities*.[16] Whilst, when excluded, they tend to develop antagonist patterns in the form of heterotopic spaces of resistance and heterological spheres of thought, when they are situated in conditions of integration they are able to effectively contribute to the actuation of invaluable conditions that Lefebvre has described as *maximal differentiation*.[17]

This form of differentiation is a particular condition that, implementing participated organisational formats, promotes engagement and mobilisation within instituted authorities. Its uptake can trigger unpredictable, yet effective, processes of reframing and redefining of non-responsive, externally imposed and obsolete systems. *Maximal differentiation* processes can create a productive realm where diversity can grow free from oppressive power in spaces of open exchange and confrontation. Its

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[15] Sharon Zukin, *Landscapes of Power: From Detroit to Disney World* (Berkeley: University of California Press, 1991).
[16] Steve Miles and Malcolm Miles, *Consuming Cities*, (New York: Palgrave Macmillan, 2004).
[17] Henri Lefebvre, *The Critique of Everyday Life*.

adoption is crucial to enhance local communities' empowerment, both at individual and network levels, foster genuine creative production, and preserve cultural expressions produced in their own socially relevant context.

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The temporal and the temporary.
Time, collaboration and architecture in post-quake Christchurch

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Abstract

This paper will look at an apparent tension between master plans that envision cities as finished objects and temporary projects that form in response to more immediate issues and concerns. In the five years since the large earthquake that struck Christchurch on February 22, 2011, a huge array of interventions, planning decisions, and design proposals have been made -affecting the lives of thousands of people and costing many billions of dollars. These actions are almost always separated into temporal categories of the short-term and the long-term; temporary and the permanent. In this categorisation there is a strange paradox in which the more concrete short-term actions are characterised as ephemeral and the paper ideas of the long-term more real.
The relationship between two forms is complex. Temporary and permanent forms of city-making can be complementary or in conflict - and sometimes both at the same time. Temporary projects can act as stepping-stones to a "finished" city, they can subvert and undermine the long-term plans, and they can support some aspects while undermining others.
The creation of a master plan in Christchurch – 18 months after the earthquakes – will be compared and contrasted with the making of a large temporary project called the Pallet Pavilion. Notions of *public engagement strategies*, *finishing*, and *risk management* will be articulated and used to illustrate how different the modes of temporary and permanent design operate in relation to the construction of the contemporary city.
Concepts from actor network theory will be used to describe the temporary and permanent forms of city-making and different associate types of collaboration. It is argued that the conception and planning of a new city and the design and construction of temporary amenities produce different experiences of time, and different forms of temporality. The authors are PhD candidates researching the role of temporary architecture in contemporary urban settings - this paper reflects on research findings from post-quake Christchurch.

Keywords: temporary, transitional, architecture, time, collaboration.

“ Temporary measures are vital to create momentum, but not at the cost of removing the imperative to create permanent solutions as quickly as possible."
      Justin Murray, "In Conversation with Richard McGowan," in *Ten Thoughts X Ten Leaders: A Future For Christchurch,* Warren and Mahoney, accessed June 20, 2015.

“ A city is the sum of numerous changing temporary forms of use, which combine to shape the slow, steady evolution of the city as a whole."
      Robert Temel, "In the Interim, Everything Changes," in *Between Times: Hotel Transvaal Catalyzing Urban Transformation*, ed. S. Lindemann and I. Schutten (Amsterdam: SUN Trancity, 2010), 161-168.

In mid-2012, a year-and-a-half after the "big" February 2011 earthquake, the New Zealand government controlled Canterbury Earthquake Recovery Agency (CERA) launched the Christchurch Central Recovery Plan, which included a spatial blueprint for rebuilding the city. The blueprint highlighted eighteen major anchor projects - including a stadium, convention centre, memorial, public parks, and an innovation precinct, to be completed between 2015 and 2021[1]. In the interim period - between the earthquake and completion of these long-term projects - hundreds of small temporary, or transitional, projects have been initiated throughout the city to address the immediate concerns of shelter and sanitation, and with more social concerns of places to eat, play, pray and make.[2] These small projects engage with a temporal condition of waiting - for the master plan to be realised - and provide an opportunity to compare contrasting strategies based on temporary and permanent projects.
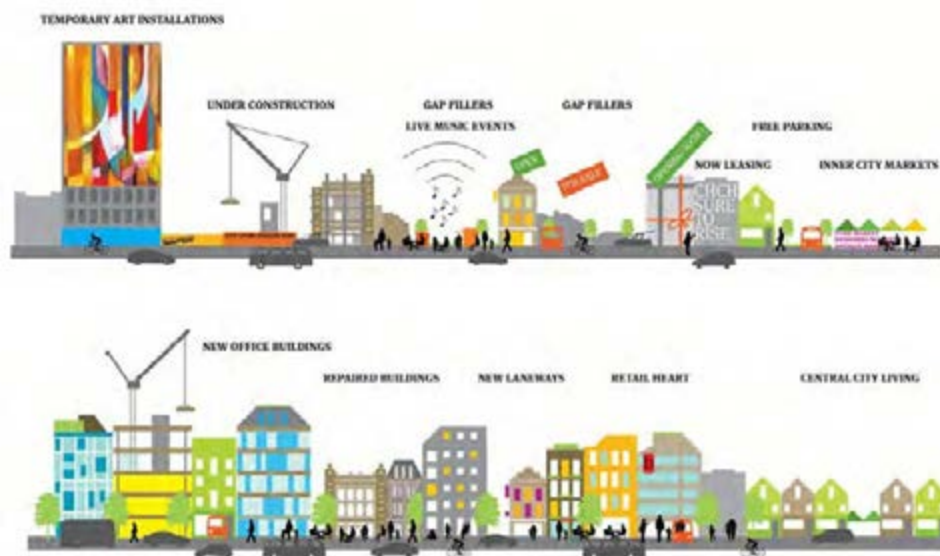
Figure 1. The Government's recovery plan compares the "transitional city" and a final permanent form. Images from *Christchurch Central Recovery Plan 2012*. Owned by the New Zealand Crown and used with Creative Commons Attribution 3.0 New Zealand Licence.

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[1] Canterbury Earthquake Recovery Authority (2012). *Central City Recovery Plan.* Christchurch, Canterbury Earthquake Recovery Authority.
[2] Barnaby Bennett, Eugenio Boidi and Irene Boles. *Christchurch: The Transitional City Pt IV* (Christchurch: Freerange Press 2013).

Temporality of waiting

The earthquakes were catastrophic to the functioning of the city and the routines of its inhabitants: schools shut down, landmarks disappeared, relatives moved away, essential services were intermittent, congregational places closed. To respond to the extraordinary disruption legislation was passed - three months after the February quake - in the national parliament that established the legal structure for the recovery, including a requirement for the local city council to develop a draft city plan.[3] The council engaged Gehl Architects, and worked with the community who responded with over 100,000 ideas for a re-imagined central city in a campaign called Share an Idea. This draft recovery plan was submitted to Christchurch Recovery Minister Gerry Brownlee who considered it for five months before accepting the general principles of the plan, but rejecting the spatial framework and mechanisms for achieving it. Brownlee then invited a consortium of experts to provide a 'blueprint' within one hundred days. This blueprint was launched on the 31 July, 2012 and became law the day after. One critic wrote that "It progressed from a framework that encapsulated a wide range of community ideals to a minister-led masterplan"[4]. This was a plan that rejected process, public discussion and community collaboration in favour of a finalised form determined by experts, on a tight deadline. The introduction of this 'finished' masterplan to the population created a temporal condition of 'waiting' for it to be realised.

Figure 2: The Government's Central City Blueprint with 18 key anchor projects.
"The Blueprint Plan" Spatial framework as part of the Christchurch Recovery Plan 2012. Owned by the New Zealand Crown and used with Creative Commons Attribution 3.0 New Zealand Licence.

[3] Canterbury Earthquake Recovery Act 2011. Accessed 20 June 2015.
www.legislation.govt.nz/act/public/2011/0012/latest/DLM3653522.html
[4] Barnaby Bennett, Ryan Reynolds, James Dann and Emma Johnson. Introduction to *Once in a Lifetime: City-building after Disaster in Christchurch.* (Christchurch: Freerange Press, 2014), 20.

Geographers Laurent Vidal and Alain Musset claim that waiting has both a temporal and spatial dimension[5]. They argue that 'ordinary spaces can often take on a different social and symbolic meaning' when the activity of waiting in involved. In Christchurch this waiting period created a kind of rupture. Gap Filler co-founder Dr Ryan Reynolds writes about this temporality in the context of the post-earthquake city:

> "For more than three years now, Christchurch has been a city completely in transition, almost without a present tense. It is a *post* city, the remains of the complicated, contradictory, post-colonial place it once was, with a centre that is 70 per cent destroyed and sparsely populated. It is also, now, a *pre*city, with three years' worth of plans, consultation, ideas and designs that exist mainly as a massive set of aspirations yet to be enacted".[6]

The notion of permanence inherent in the blueprint - the qualities of stability, durability, endurance, and of things remaining unchanged – fulfils the expectations of contemporary cities as coherent and well-formed places. Permanent form provides homes for long-term institutions, cultural identity, predictability of function, and a stable backdrop for various types of social behaviours.

The loss of the stable and predictable experience of the city after the earthquakes and the idea of waiting - without amenity - several years for a finished version of the city, however was not feasible, possible or bearable to many Cantabrians. "Three to five years is a short time in the life of a city, but quite a long time in the life of a child."[7] Waiting suggests a passive experience of time in which action is taking place elsewhere. To wait for something means one is not part of that collaboration of the thing that one is waiting for. Waiting can also be detrimental to the mental health of citizens. Charles Montgomery summarises in *The Happy City* that participation in geographic and spatial decision-making has real and tangible effects on the health and well-being of citizens. The lost opportunity for improvements in mental health by *not* being included in these processes is a logical inverse of this. A few months after the large February quake the Science Advisor to the Prime Minister of New Zealand stated that the exclusion of the public from the planning of the city is likely to extend the sense of loss of control that was created by the quakes and negatively impact on its citizens. [8]

Temporality of making
For people living in the post-disaster setting the experience of waiting has been contrasted with the extensive and pervasive amount of things that needed attention; insurance policies, broken plumbing, difficult roads, and damaged cultural amenity. Adding to these everyday pressures was the need to rebuild and reimagine the city, and citizens

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[5] Vidal, Laurent, and Alain Musset, eds. *Waiting Territories in the Americas: Life in the Intervals of Migration and Urban Transit.* Cambridge Scholars Publishing, 2016.
[6] Ryan Reynolds. "Desire for the Gap", in *Once in a Lifetime: City-building after Disaster in Christchurch*, (Christchurch: Freerange Press, 2014), 167.
[7] Fran Tonkiss, "Austerity Urbanism and the Makeshift City", *City* Vol 17, n. 3 (2013): 312-24, 312.
[8] http://www.pmcsa.org.nz/wp-content/uploads/Christchurch-Earthquake-Briefing-Psychosocial-Effects-10May11.pdf. Accessed October 1, 2017.

were motivated to step up and take part in this process.[9] The events following the earthquakes provided a window for people rethink how the city is constructed - from how they travel and recycle waste, to how institutions govern, and how buildings are created. These thoughts or questions often turned into scenarios where citizens created temporary projects to respond to unmet demands or imaginations. Many people could not wait; they began to make things, and often they did this in public with other people. The complicated dichotomy between the long-term planning by CERA and the temporary projects led by citizens and citizen-led organisations can be explored through the notion of collaboration in the interim period of waiting. Collaboration is "the action of working with someone to produce something" together.[10] This conventional definition of collaboration can be expanded by Actor-Network Theory to include collaboration with things such as materials, drawings, institutions, and publics.[11] In this expanded definition collaboration is not just a matter of *working with people* but becomes a method to understand how different types of collaboration among subjects and objects produce different effects. Thus the conception and planning of a new city, and the design and construction of temporary amenities, are the result of different types of collaboration that in turn produce different experiences, and different experiences of time.

One prominent example of intense collaboration was the Pallet Pavilion, a temporary performance and meeting space initiated by creative urban regeneration initiative called Gap Filler, which occupied a vacant site in the central CBD from October 2012 until May 2014. The Pallet Pavilion was a series of stacked blue pallet-crate walls that enclose a performance space. Gap Filler cited two main reasons for developing this project: first, the immediate and practical concern that there was a shortage of venues in the city; and second, as a demonstrative desire to show that innovative and cheap temporary architecture is possible in responding to post-earthquake demands.

Temporary projects, like the Pallet Pavilion, are "the opposite of the master plan," because they start "from the context and the current condition, not from a distant goal".[12] A project like this dealt with its immediate context and problems – the need for a performance space with the means and materials directly available. The temporary project was produced by a collection of volunteer experts – such as Architects and project managers - and constructed from borrowed materials.

The resulting project was a combination of: the site of an old hotel on an important diagonal axis in the city, a team of volunteer professionals (architects, designers, builders, contractors), a large group of in-kind and financial sponsorship, around 2000 hours of volunteer labour, roughly 2000 blue shipping pallets, 15 large concrete T-shaped floor slaps, the local council, the fire department, a lighting designer, second-hand plants that were being discarded and inbuilt irrigation system to water them, four portaloos, and much more.

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[9] John McCrone in The Press. "A temporary long-term solution," Accessed 26 April 2012. www.stuff.co.nz/the-press/news/christchurch-earthquake-2011/6992137/A-temporary-long-term-solution
[10] "Oxford Dictionary," *Oxford University Press,* Accessed 20 June 2015. www.oxforddictionaries.com/definition/english/collaboration.
[11] Bruno Latour, "Technology is Society Made Durable" In J. Law (ed.) "A Sociology of Monsters Essays on Power, Technology and Domination", *Sociological Review Monograph* 38 (1991): 103-132.
[12] Florian Haydn and Robert Temel, *Temporary Urban Spaces: Concepts for the use of City Spaces.* (Basel, Birkhäuser, 2006), 12.

Figure 3: Pallet Pavilion during construction 2012.
Image from the book, *Christchurch: The Transitional City, Pt IV*. Used with permission of the publisher.

The space became a symbol of an alternative approach to the rebuild: it had hundreds of unique events, gathered tens of thousands of people over 18 months. After its funding ran out after its first year - it was originally planned for one summer - a crowd-funding campaign raised over $NZ 80,000 to keep it going for another summer.During the design of the Pallet Pavilion an unexpected turn introduced a new series of collaborators. The fire department would only let the project happen on the condition that it have 24-hour site supervision. The need for 24-hour site supervision led to the building being open to the public 24-hours day. This in turn created the space and time for different user groups to access the free amenities of the building. It became the only site in the central city where free water, power, free wifi, and some shelter from the weather that could be accessed by anybody, and subsequently became a place that many different groups used including homeless people with the need for a safe public space to gather.

Actor network theory argues that a full account of a situation requires recognition of the, often disruptive, role that non-human things play in the making of projects. Collaboration is a complex process that requires engagement with both humans and non-human things.

Physical and material things can enable, thwart, prohibit, suggest, or discourage certain human behaviours and actions. In novel situations with new collaborations, unconventional environments, or different materials, the consequences can unpredictable. The challenge in these circumstances is to keep collaborate processes open so the project can adapt to surprises, but this also introduces shifts and adaptations not expected in longer term forecasts. By using temporary projects to fill in the time of waiting, with a time of making, new, unexpected and often productive forms of city-making can emerge.

The differences for design

At first glance the permanent projects planned by CERA appear to be the antithesis of the temporary projects. They work across different scales, economies, time-frames and levels of expertise. The large-scale projects are costly, long-term and slow to build - developed in a complex assemblage across different time-zones and and multiple consultancy teams who are paid handsomely for their time. The bulky structures will emerge in reinforced concrete, steel and glass. Temporary projects are small-scale, quick, cheap, and often rely upon local volunteer labour. While they seem like stable propositions, the planned "permanent" project may not always eventuate. (By the middle of 2016 only three of the eighteen anchor projects had been completed.) The temporary often lasts much longer than anticipated. An analysis of 185 temporary projects in the book Christchurch: The Transitional City shows the temporary project lasted, on average, almost twice as long as anticipated. While temporary and permanent urban projects are defined by their different time scales, this shift in thinking around permanence indicates a number of ways in which materials, labour, and other things can be considered, and this in turn changes the way designers relate to them. This difference can be viewed through three categories: strategies for public engagement, finishing, and risk management.

Firstly, the various scales of the projects reveal different *strategies for public engagement.* The relatively short time-frame and small scale of temporary projects sees the distance of makers and users contract. In the temporary projects "the designer remains embedded with their public and that responsibility becomes a shared one, and one that gives space for the designer to usefully contribute their expertise while engaging users in taking on and continuing to develop results".[13] This is evident at the Pallet Pavilion where the use of volunteer labour and construction materials saw many people from the wider community incorporated in the decision-making process of the project.

Secondly, a permanent project is considered *finished* when it is opened while a temporary project is finished when its use comes to an end. If something is unfinished, it can still be changed; in some circumstances, this change is invited. Finished buildings often treat change and alteration as a threat requiring great expense and more lost time. These forms are crystallised long before the public becomes engaged in their use. The potential of the unfinished project is evident with the Pallet Pavilion was conceived to last for one summer the issue of the materials at the end of that summer led to new collaborations.

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[13] Guy Julier, "From Design Culture to Design Activism", *The Journal of the Design Studies Forum* Vol. 5, n. 2 (2013): 215-236, 230.

The pavilion was only finished once it was carefully deconstructed and its parts returned to the supply chains from where they came: the pallets to the shipping company, furniture deconstructed to vegetable boxes and the concrete foundations donated to farmers to use as bridges. While the public was waiting for the *finished* project, they were also actively participating in the life of the unfinished project, and an unfinished city.

Thirdly, each type of collaboration creates different *risk management* approaches. Permanent projects manage large financial and technological risks. Collaborations among experts are preferred to collaboration with citizens. The temptation for designers on large projects is to favour strategies that design out the risks involved of working with unpredictable actors. Temporary projects do not have the same pressures and offer different opportunities. For example the lack of a roof in the pallet pavilion led to the need to engage with the weather. On some nights this was difficult and led to rain and cancellations. On others it created circumstances not possible in conventional venues such as a performance under a moonrise or colourful lighting reflecting of the rain as it bounced of drum skins on the final night. The presence of the rain, the sun, the wind and the moon at times made the management of the venue difficult, but it also reminded the users of the space of various movements of weather and cycles of time that cities often act to remove because they are seen as threats to efficiency and safe management of assets.

The degrees of public engagement, finishing, and risk management reveal different levels of bringing networks of people (or publics) into projects. By becoming agents in an ongoing design processes, citizens - with other collaborators – develop greater agency to negotiate with the forces that influence their built environment.

Conclusion

This essay proposes that the difference between temporary and permanent architecture can be understood in the way that different collaborations gather together to co-produce the built environment. One of the effects of temporary architecture is that it highlights and questions practices that produce other, more permanent, forms. While the processes that produce large-scale plans and more permanent forms tend to be ones of closing down broad collaborations with the public once a form is constructed, in contrast the temporary continues to open up opportunities for engagement and change. By creating a brief comparative case study analysis that contrasts a temporary project with a permanent plan it contributes to a global conversation about the role of place-making, temporary architecture and citizen led interventions into public space.

Temporary projects, such as the pallet pavilion, shift the role of the public from a passive agent that is consulted during design and that uses a building after construction to a more meaningful role as an ongoing and active participant – collaborator - in the creation of events and procedures in the ongoing life of buildings and cities. Perhaps the opportunity of these temporary post-quake projects is a movement towards a type of design, a form of public space, and a different way of making buildings in which the public is more carefully and cleverly represented and kept visible.

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Architecture as a pathway to reconciliation in post-earthquake Christchurch

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Abstract

This community-based and culturally-situated design research project reflects on issues of community empowerment and activism through speculative design meant to provoke discourse within the wider New Zealand community. As design-led speculative architectural research, it reaches beyond the confines of professional practice. It challenges the norms of contemporary New Zealand architecture by investigating new architectural approaches to explicitly reflect the cultural identity of New Zealand Māori. The devastating earthquakes of September 4, 2010 and February 22, 2011 destroyed much of Christchurch. While a terrible tragedy, it also opened up the city for fundamental community based discussion. The idea of a post-colonial not just a post-earthquake city emerged, driven by Māori design and planning professionals following the leadership of local elders. The situated community for this design-led research investigation is the Ngāi Tahu iwi (Māori tribe) of Ōtautahi / Christchurch. Ngāi Tahu professionals in Ōtautahi / Christchurch developed key design aspirations pertaining to the future architecture and urban design of the new city. The city rebuild offered an opportunity to present a Ngāi Tahu vision that reflected its place identity in the new city. The site for this design research investigation is the Ngāi Tahu owned King Edward Barracks, within the Ōtautahi / Christchurch central business district. This traditional Māori settlement site had been covered with a disparate collection of urban colonial buildings, several of which were destroyed or damaged in the earthquakes. If this Ngāi Tahu owned site (and the city as a whole) is to be rebuilt, is there an opportunity for its architecture to reflect Ngāi Tahu, rather than Eurocentric models? And if so, how might such a design embody Māori and Ngāi Tahu identity, while enhancing New Zealanders' awareness of traditional Māori design, values, and customs – all within the context of a contemporary urban fabric?

Keywords: community projects, post-earthquake Christchurch, narrative architecture, Māori identity, speculative architecture.

Ka tahuri te riu o Te Waka a Maui ki raro

To many in Ngāi Tahu the events of February 22, 2011 had parallels with another catastrophic event, the fall of Kaiapoi Pā in the 1830s. Kaiapoi Pā, the largest Ngāi Tahu settlement in the South Island, was decimated by the musket-bearing armed forces of Te Rauparaha. One elder said of this event:

> *"Ka tahuri te riu o Te Waka a Maui ki raro"*
> English translation *"The great canoe of Maui has capsized."*

This dramatic saying – likening the defeat of Kaiapoi Pā to the overturning of Maui's Canoe (South Island) – literally suggested that their entire world had been flipped over, irrevocably changed[1]. The numerous hapū (communities) of Ngāi Tahu came together after this event, to reclaim its mana (prestige), and this event was the birth of a unified Ngāi Tahu identity[2]. In times of great hardship such as this – particularly their entire world flipped over by the Christchurch earthquakes – Māori leaders have looked to the creation of *whare whakairo*, traditional carved meeting houses that symbolise the Māori universe in architectural built form. These *whare* establish visual and experiential narratives of collective community identity, bringing members of a tribe together under common ancestry and association with the landscape[3][4][5]. In the design-led experiment undertaken in this research investigation, the *whare whakairo* was used as a mnemonic device, integrated with the allegorical program of a Māori carving school. The principal objective was to examine architecture's ability to recreate a collective sense of Ngāi Tahu belonging and identity for the community. The carvers' school allegorical programme was conceived fundamentally as a Māori Māoriorative (community-based) investigation. The design concepts arose from user and community participation through intense consultation with Ngāi Tahu elders, architects and carvers. The research objective was to create a uniquely indigenous design response to post-earthquake Christchurch.

Research site

The site for this design-led research investigation, the Ngāi Tahu owned King Edward Barracks within the Ōtautahi / Christchurch central business district (fig. 1), had a rich cultural history prior to colonisation. The early tribe Waitaha first established the Puari settlement over 700 years ago on a large island-like area between the modern-day Carlton Mill Corner and the loop in Ōtakaro (Avon River) near the King Edward Barracks site[6]. In the 1500s another tribe, Kāti Mamoe, migrated from Te Ika a Maui (North Island)

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[1] Grey, Sir George. Nga Mahi a Maui. Wellington City Libraries. Accessed 13 September 2016. http://www.wcl.govt.nz/maori/wellington/maui1.html.

[2] Ngai Tahu 2025. Accessed 5 June 2016. http://ngaitahu.iwi.nz/wp-content/uploads/2013/06/NgaiTahu_20251.pdf

[3] Brown, Deidre. "The Architecture of the School of Māori Arts and Crafts". *Journal of the Polynesian Society*. 108, 3 (1999): 241-76.

[4] Brown, Deidre. *Māori Architecture: From Fale to Wharenui and Beyond*. Raupo: Auckland, 2009.

[5] Grant, Lionel, and Skinner, Damian. Ihenga: Te Haerenga Hou: The Evolution of Māori Carving in the 20th Century. Auckland: Reed Publishing, 2007.

[6] Christchurch City Council. Christchurch before 1850. The First Peoples Waitaha to European in Christchurch. Accessed 8 Oct. 2016. https://www.ccc.govt.nz/assets/Documents/Culture-Community/Heritage/christchurch-before1850-re-printed-june-2009-publications.pdf.

and settled within the Waitaha area, including at Puari before spreading further south. This was followed by the migration of Ngāi Tahu from the north onto Banks Peninsula, into Canterbury and throughout the South Island during the 1700s.[7]

Figure 1. Ngāi Tahu owned King Edward Barracks site in Christchurch.

This design research site in the Christchurch central business district was originally a swamp; and so in the new design intervention the site was conceived as a metaphorical swamp (fig. 2) – an eternal reminder of the original landscape for the youth of Ngāi Tahu as well as the inhabitants of Ōtautahi / Christchurch.

While the incorporation of mythology into a community and situated research project may seem antithetical to the traditional view of such projects representing 'real world' situations, McIntosh et al argue that cultural story-telling is a fundamental attribute of Māori cultural identity taken from a values based perspective[8] [9].

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[7] Rawiri Te Maire Tau, "Ngāi Tahu, From 'Better Be Dead and Out of the Way' to 'To Be Seen to Belong,'" in *Southern Capital: Christchurch: Towards a City Biography 1850-2000,* in Cookson, John and Graeme Dunstall, ed., 233, Christchurch: Canterbury University Press, 2000.

[8] Hanson, Allan. "The Making of the Maori: Culture Invention and Its Logic". *American Anthropologist.* Vol. 91. n. 4 (1989): 890-92.

Figure 2. Design site conceived as a metaphorical return to the original swamp.

Local Ngāi Tahu knowledge dictated how one traversed such a landscape, and in this way the original landscape was dependant on Ngāi Tahu storytelling. As part of the Christchurch rebuild, the speculative design concept proposes to excavate this urban site (now destroyed by the earthquakes) below the water table, revealing the lost landscape of the Ngāi Tahu swampland (fig. 3).

The Ngāi Tahu people, as the protectors of both the waterways and the local eel populations, considered Kaitiaki tuna or spring eels sacred; and this allegorical "architectural swamp" represents the materialisation of the realm of the eel gods through architecture. Suspended above the allegorical swamp, the principal structure of the architectural design symbolically represents a traditional hinaki (eel trap; fig. 4); and the "eel" becomes the allegorical path by which the visitor experiences the internal spaces and the progression through the building (fig. 5).

The hinaki design acts as a bridge spanning the artificial swamp and metaphorically linking the past with the future. The reference to the Bridge of Remembrance[10], a key feature of the Ōtautahi / Christchurch landscape, provides an anchor that references the design within the present.

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[9] McIntosh, Alison, Frania Kanara Zygadlo and Hirini Matunga. "Rethinking Maori Tourism". *Asia Pacific Journal of Tourism Research*, Vol. 9 , n. 4 (2004): 331-352.

[10] Christchurch City Libraries. The Bridge of Remembrance. Accessed 23 May 2016. https://my.christchurchcitylibraries.com/bridge-of-remembrance.

Figure 3. Site section of carvers' school hovering above artificial swamp.

The bridge can be considered a metaphorical pathway to the past, reconnecting people to the landscape and their heritage through the articulation of ritual in the internal spaces.

> "*Now it is time that gods emerge from things by which we dwell...* "[11]
>
> – Ranier Marie Rilke

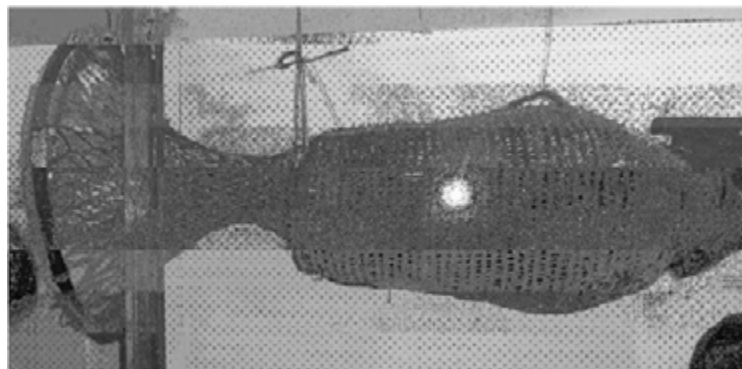Figure 4 (top). Traditional hinaki (eel trap) from the collection of Okains Bay Māori and Colonial Museum.

Figure 5 (down). Section demonstrating circular form modelled on traditional hinaki (eel trap) emphasising the importance of eel culture to local Ngāi Tahu.

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[11] The first lines of a poem by Ranier Marie Rilke, 1925, cited by D.F. Krell in *Martin Heidegger: Basic Writings,* New York: Harper & Row, 1977: 320.

Research programme

According to Trickett[12], when design research projects are not only community-based but also culturally-situated, applying an ecological perspective can lead to useful multilevel interventions. This culturally-situated research investigation incorporated the ecological perspective by developing a thematic matrix (fig. 6) and an experiential *whare whakairo* (traditional meeting house) phenomenology matrix (fig. 7) were developed to establish the narrative and sacred progression through the speculative design of an allegorical carving school. These matrices were also used to develop the conceptual thresholds of the *whare whakairo* and *powhiri* (welcoming ceremony) into a functioning program for the carving school, integrating the culturally-situated with the community-based.
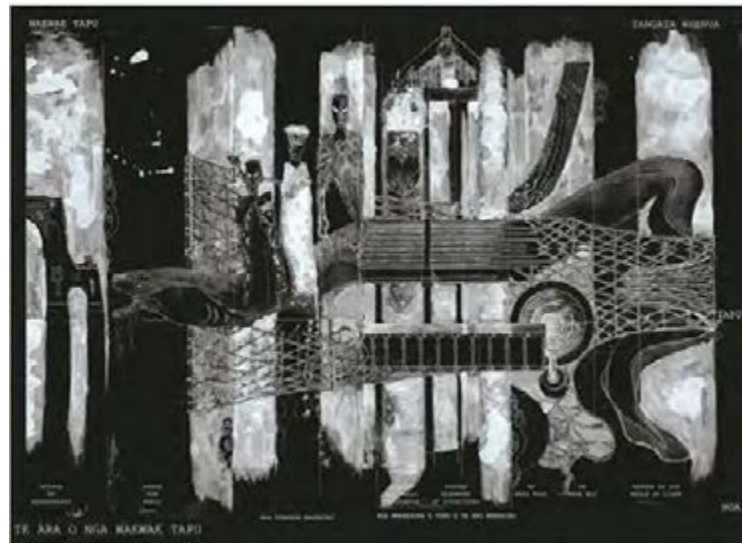
Figure 6. Thematic matrix for the carvers' school.

The identification of public and private spaces is articulated through the progression from *waewae tapu* (visitors) to *tangata whenua* (hosts). Once you enter the building and enter into the ritual of the *powhiri* you are in *tapu* (sacred) spaces; and it is not until you have passed through and removed the *tapu* that you can enter into the *noa* (secular) spaces and exit the building safely. The differentiation between *tapu* and *noa* is based upon the importance of that space and its role within the ritual of the *powhiri*.

Progression from light to dark

Dr. Pakaariki "Paki" Harrison, renowned *tohunga whakairo* (expert carver), demonstrates the importance of understanding the procession from light to dark as one progresses through a traditional *whare whakairo*:

> *The house is light in the front, expressing warmth and optimism and gradually gets darker to the rear, symbolising the awesome power of night. Those elements that are useful and friendly to man are in the front and those that are hostile or indifferent are at the back. The subtle changes from darkness to light have been created to illustrate in visual*

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[12] Trickett, Edison. "Multilevel Community-Based Culturally Situated Interventions and Community Impact: An Ecological Perspective". *American Journal of Community Psychology*. Vol. 43 (2009), n. 3-4: 257-66.

metaphor the creation genealogies of Te Kore (the void), Te Po (the night) and Te Ao Marama (the world of light). This extra dimension imposes a grander design on the total format, capturing the emotional context of these perceptions and superbly embodying the Māori myth of creation.[13]

Figure 7. Experiential *whare whakairo* phenomenology matrix for the carvers' school.

In this way, the metaphorical *whare whakairo* tells the community the tale of the Māori creation myth, the emergence of life from the void of darkness. The house itself may be seen as the embodiment of a common ancestor, his *koruru* (carved head) presented at the apex of the bargeboards where another important ancestor stands as a *tekoteko* (fully carved figure). The *maihi* (bargeboards) at the front of the house are his arms, which end in *raparapa* (fingers). The porch area is known as the roro (brain), and the inside is the *poho* (belly). The symbolic passage for living members of the tribe between the world of myth and the world of history is the doorway to the interior of the house, traditionally recognised in all meeting houses as a dangerous tapu threshold and boundary between two cosmological orders.[14]

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[13] Paki Harrison, cited in Ranginui Walker, *Paki Harrison: Tohunga Whakairo: The Story of a Master Carver,* Auckland: Penguin Books, 2009: 154.

[14] Neich Roger, Tiwai Amoamo, and Tuhe Tupene, "The Complementarity of History and Art in Tutamure Meeting-House, Omarumutu Marae, Opotiki," *Journal of the Polynesian Society* 93, no. 1(1984): 5-38.

Sacred spaces

Like the interior of the *whare whakairo*, in this community-based and culturally-situated design investigation the interior spaces are large and open to allow for multiple interpretations of how the spaces can be used. There are three entrances to the sequential carving spaces that students use, based on the three stages of their education (fig. 8); the first space encountered is for the youngest students and the final space is for the most experienced. These entranceways are framed by glass to explicitly read as sacred thresholds, the light framing the darkness as one passes from one realm to another. For the main entrance *powhiri* space, a pair of steel columns is reminiscent of traditional *poupou* (panels representing spiritual connection to ancestors) within the *whare whakairo* (fig. 9).
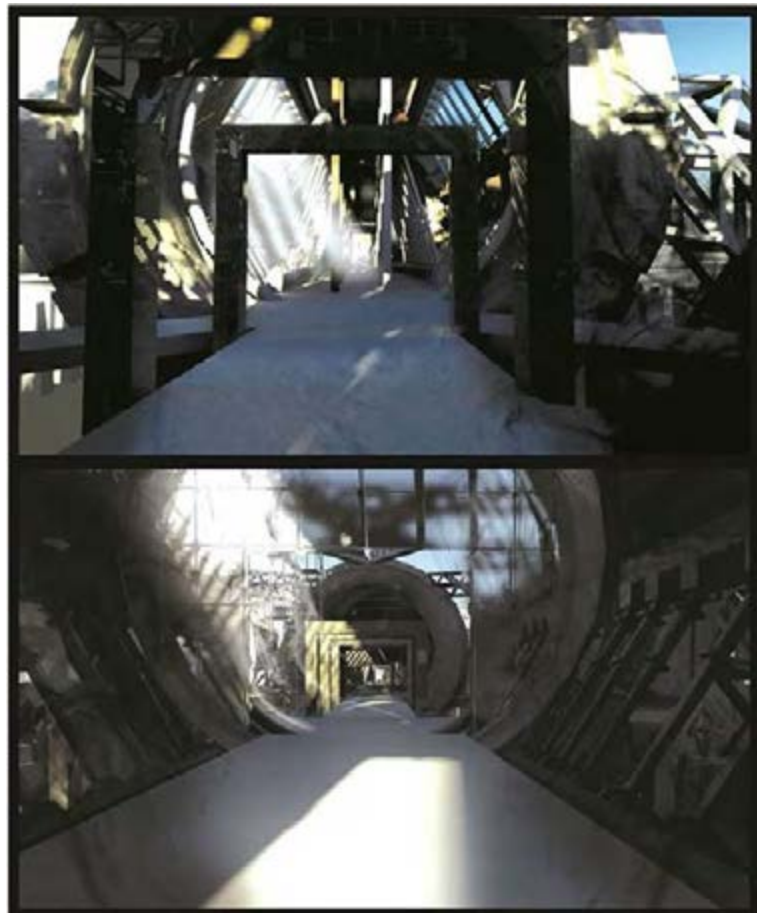
Figure 8. Entry sequences based on stages of a student's education.

It is envisioned that the use here of large steel elements might encourage the carving students to look at other materials and how their stories might also be told through a steel beam or concrete column incorporated into the *whare whakairo*.

Each of the three entrances has the quarters of the carving master residing above, as a reminder to students of their lessons and as a *kaitiaki* (guardian) over the students. In this way, the carving master 'inhabitant' is presented to the Māori community as incorporating both real and mythological attributes. These quarters are accessed in the

same way as the traditional *pataka* (raised storehouse) – set upon a single pole and accessed by another pole with diagonal cuts carved into it for steps.

Figure 9. Main entrance with steel columns reminiscent of traditional *poupou*.
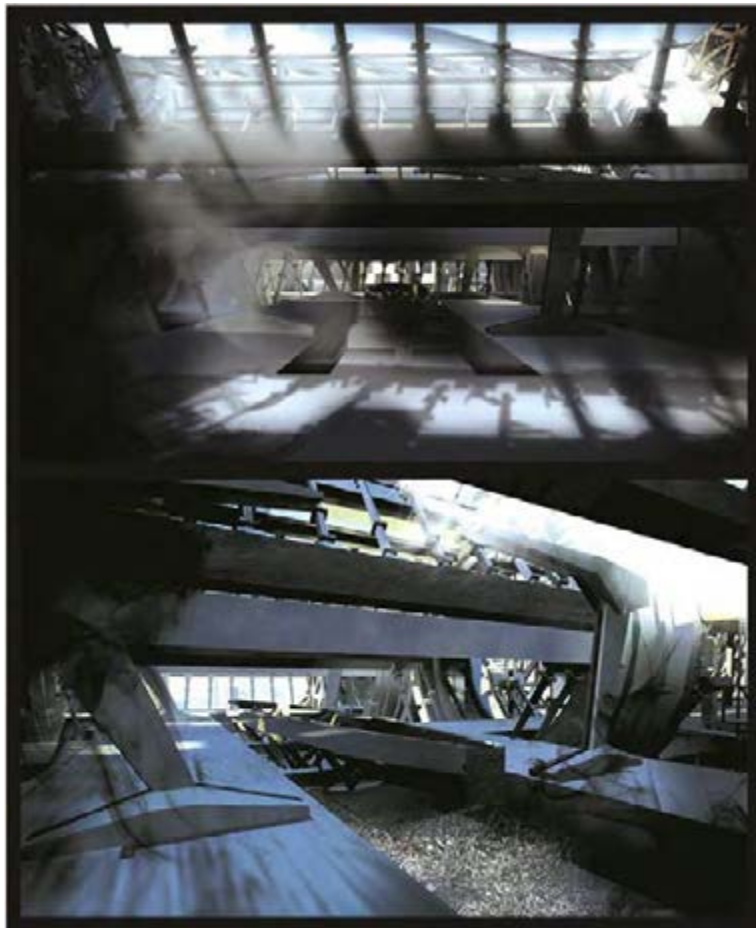
Figure 10. Carving room demonstrating waka carving.

For the carving of waka in this structure, large timber logs are to be "floated" below the structure and lifted into the waka carving area (fig. 10). Once the waka is hulled out and carved, the waka can be lowered back down into the "swamp." The many wood chips that accumulate below the waka fall down into the "swamp," changing the landscape over time. In this traditional way, the sacred carving chips are returned to the landscape as an offering to the gods for the safe travel of the waka. The return of the building materials to the natural landscape exemplifies an culturally-situated ecological framework for the project (refer to Trickett).

Community involvement in the project

The primary author was a key part of hui held by Ngāi Tahu elders and design professionals to discuss how they could contribute to the future Christchurch, following the words of Ngāi Tuahuriri elder Te Ari Pitama: "Kia atawhai ki te iwi" – "To care for the people." A key premise was that the city would welcome the people, and would share the identity of the tangata whenua (host) – which became the basis of the design. In the development of the design, critical considerations pertaining to the sacred role of the powhiri were discussed with Ngāi Tahu elders to ensure everything presented was "tika" (correct). At their request the author attended and participated in powhiri rituals on the author's own marae, to gain first-hand knowledge at the "feet" of whanau elders.
From these conversations arose the design-led culturally-situated research idea that the future public buildings and urban spaces needed to accommodate Ngāi Tahu ritual. Ngāi Tahu elders outlined the importance of being able to "speak to the landscape of their ancestors" during such processes (another important component of the 'ecological framework'), by retaining viewsheds to prominent landscape features, incorporating native plantings, acknowledging historic trails and mahinga kai (customary food gathering sites), and allowing for the use of architectural spaces for cultural purposes. It was proposed that culturally-situated ideas arising from Ngā Aho ritual and culture could be incorporated into the overall blueprint for the entire Christchurch rebuild of a new city.

Empowerment and activism

To elicit culturally appropriate and authentic design concepts, a speculative scenario was proposed to the elders of how one would conduct an "Opening Ceremony" at the completion of the central city rebuild. Where in the city would such a ritual begin, and where would it end? How could these future spaces accommodate such a ritual and become the backdrop to this momentous occasion? When entering a *whare whakairo*, a *powhiri* (welcoming ceremony) is held. An opening ceremony begins at a gateway[15], so where would the gateway to the city be? Karakia (communications with the gods) focus on the *poutokomanawa* (the carved central pole of a *wharenui* or meeting house). So where would the *poutokomanawa* of the city reside? This conversation with the cultural community of Ngā Aho around the hypothetical scenario of the "opening ceremony" ritual was a successful design and communication tool to frame conversations with iwi

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[15] The Marae – meeting place. In New Zealand in History. Accessed 25 July 2016. http://history-nz.org/maori5.html.

elders, to ask the right questions, and to develop cultural knowledge for architectural design considerations.

To convey these concepts to a wider audience, Ngāi Tahu joined with Ngā Aho and Manaaki Whenua to organise a two day workshop inviting all the key organisations and professionals involved in the rebuild, including architects and engineers, construction companies and project managers, government and council officials. This was a proactive step to present an explicitly Māori vision for the future, and to develop relationships with the future-builders of Ōtautahi / Christchurch. From these discussions two key spaces in the central city were identified where the Ngāi Tahu narrative could be expressed architecturally:

- The Ōtākaro / Avon River can be interpreted as the city's tāhuhu (main ridge pole of a wharenui) – connecting spaces, reflecting the landscape connection, and acknowledging Ngāi Tahu values for *mahinga kai*;
- Victoria Square was an important Ngāi Tahu kāinga (settlement) where Ngāi Tahu lived for generations, and a place of early Ngāi Tahu interaction and trade with European settlers. Simultaneously, it can be seen as an acknowledgement of Queen Victoria, the Treaty, and the courts where the Ngāi Tahu treaty claim was discussed. Part of this complex was returned to Ngāi Tahu in the Settlement. Its location and proximity to the river would make it a key "Gateway" and ideal place to initiate the narrative of the new city.

University-based research projects such as this can play a significant role in stimulating the development of interdisciplinary practices and the emergence of community[16]. Collaborative community-based research should not be dismissed simply because it might appear biased in favour of the client groups with which researchers work. Instead, it should be embraced as a practice that, when well done, can help clients to better identity and address problems, practices, and policies that affect their lives and their communities." [17]. The collaborative process can lead to important policy changes, but to do so, it is essential that it contributes to community empowerment, ie, "the capacity to set priorities and control resources that are essential for increasing community self-determination"[18]. The impact of this research investigation is evidenced by its significant contribution to enhancing Ngāi Tahu community empowerment. Ngāi Tahu became equal partners in the rebuild, and as part of their role as equal partners in the rebuild, Ngāi Tahu provided the culturally-situated narrative that underpinned and guided some of the community-based decision-making in the Central City Blueprint and Recovery Plan. This also established a process for engagement where Ngāi Tahu professionals, designers and planners, worked within the Blueprint team "shoulder to shoulder" to translate the culturally-situated aspirations of Ngāi Tahu elders into tangible community-based design outcomes that helped to accelerate the process of engagement with Ngāi Tahu. This community and iwi engagement process was followed in other key architectural design

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[16] Siedlok, Frank, Paul Hibbert, and John Sillince. "From Practice to Collaborative Community in Interdisciplinary Research Contexts". *Research Policy*. Vol. 44, n.1 (2015): 96-107.

[17] Shdaimah, Corey, Roland Stahl, and Sanford Schram. *Change Research: A Case Study on Collaborative Methods for Social Workers and Advocates*. New York: Columbia University Press, 2011:4.

[18] Himmelman, Arthur Turovh. "On the Theory and Practice of Transformation Collaboration: from Social Service to Social Justice". In Huxham, Chris, ed. *Creating Collaborative Advantage*. London: Sage Publications, 1966: 19-43.

projects along the Ōtākaro / Avon River where Victoria Square and Puari and Tautahi (historic Ngāi Tahu sites) are located. Ngāi Tahu elders were engaged to provide cultural knowledge, and a clear process was established early so that their knowledge was a key driver. The design process began with ritual blessings and traditional food that also helped to frame the communal nature of the relationships and engagement.

The newly designed Regional Sciences and Innovation Centre in central Christchurch (figg. 11–12) exemplifies this exceptional level of community engagement – where Ngāi Tahu architects were imbedded in design teams to expedite the consultation process and deliver authentic cultural design outcomes.

Figure 11. The Regional Sciences and Innovation Centre, designed by Jasmax, DJRD and Royal Associates Architects, with Ngāi Tahu architects forming part of the design team (Image courtesy of Jasmax).

Figure 12. Regional Sciences and Innovation Centre design interior (Image courtesy of Jasmax).

This design was influenced by the story of Tawhaki ascending the Heavens and establishing the pathway to knowledge. The relationship of the building to the landscape was conceptualised as a tool for learning and connected to the Ngāi Tahu values for mahinga kai (cultural heritage) and kaitiakitanga (guardianship). The Christchurch Rebuild Blueprint also included a proposed Te Puna Ahurea Cultural Centre (figg. 13–14; no longer going ahead) that represented another real opportunity to create a distinctive Ngāi Tahu architectural and programmatic statement.

Figure 13. The Te Puna Ahurea Cultural Centre design by Royal Associates
(Image courtesy of Royal Associates).

Figure 14. Artist's interpretation of design for Otākaro / Avon River incorporating Ngai Tahu design aspirations. Produced by Royal Associates Architects (Image courtesy of Royal Associates).

Conclusion

Architecture as an expression of culture and identity has the power to uplift and unify – but it also has the power to oppress and marginalise when groups are excluded from the process. For the past 150 years Ngāi Tahu have lived in a city described as "little England," devoid of an expression of their own culture and values. The opportunity to express Ngāi Tahu identity in the new city was coupled with the realisation and fear that the rebuild could also be a process whereby Ngāi Tahu are "colonised all over again."

The fact that Ngāi Tahu have had a significant place in many aspects of the rebuild attest to this not being the case with: Ngāi Tahu seen as equal partners with CERA (Canterbury Earthquake Recovery Authority) and CCC (Christchurch City Council); Ngāi Tahu engagement as artists and designers; young Māori trade training and up-skilling; and Ngāi Tahu championing grass-roots and community groups.

This university-based design research investigation played an important role in helping to bridge the gap between Eurocentric community-based and Māori iwi culturally-situated aspirations and propositions. It also helped to cement the role of Te Runanga o Ngāi Tahu as a partner to the Christchurch City Council and the Canterbury Earthquake Recovery Authority in the rebuild, and it has demonstrated and reinforced the value indigenous cultures can bring to the restoration of post-disaster cities. This group became involved in the development of the Central City Blueprint and Recovery Plan, to develop further these aspirations for the new city and explore additional opportunities to express this narrative. For many, this was our generation's 'Te Kereme' – a chance to do our part for future generations and have our ancestors and stories acknowledged in the future city, and by successfully coupling community-based and culturally-situated design research, ideas for a successful rebuild were able to actually represent the greater community of Christchurch.

Queensland University
of Technology

University praxis. On exchange between professional and academic practices in architectural education

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Abstract

This paper records and reflects on two architecture design studios situated between academic and professional practice contexts. It is motivated by the level of both student and external engagement generated by the studios, which occurred at a significantly higher level than that generated by similar studios that regularly run at VUW School of Architecture and other schools of architecture. The objective is to retrospectively understand the unique or special aspects of these studios for future reference.

As a working method, the Cuba Street studios are first described in terms of the motivation, the context, the community engagement set up, their brief and their modus operandi. Outcomes of the studios are then evaluated through our observations and critical reflection on the ways engagement between University and professional practices occurred, and how these interactions affected the student learning and external engagement. Reference is made to the relevant literature, the critical intents of the studios, the immediacy of both the proximity and the seriousness of the motivating problem, the inputs of external bodies, and the detail of the student outcomes in terms of both expectations, and the nature of the outcomes.

The paper argues that clarity about characteristics, strengths and weaknesses of academic practices, can augment the potential effectiveness of future architecture design teaching associated with professional engagement, and that the collective framing of student research-led design can deliver research outcomes with a significance greater than the sum of their parts.

Keywords: architectural education, praxis, heritage, seismic retrofit, urban regeneration.

Introduction

The Cuba Street studios were motivated by architectural opportunities following the post Christchurch earthquakes. There was an urgent need to educate students, building owners, and the local public around the need to seismically-upgrade dangerous[1] historic building stock as found in the Cuba Street precinct of Wellington, and about the architectural design implications associated with this context.

The studios operated as a research partnership with Wellington City Council and Heritage New Zealand. They addressed design opportunities arising from building reuse and the renewal of urban form, the need for structural upgrading, heritage retention and adaptation, and the intensification and integration of new buildings into a listed precinct. The design studios integrated teaching collaborations across parallel technology courses to create student opportunities for applied and collaborative learning.

The studios delivered high levels of student, community, and disciplinary engagement[2]. This paper is motivated by curiosity about why and how the studios had delivered these outcomes? We wanted to establish if the studios had ongoing pedagogic relevance, and what the impact of the engagement with local community and professional practice contexts upon student learning had been. The studios included collaboration between the Wellington City Council, Heritage New Zealand, and Victoria University of Wellington School of Architecture, and were held in the second Trimesters of 2012 and 2013. There were inputs from a large group of Wellington professional Architects and Structural Engineers as specialist tutors and critics.

Architectural education both prepares students to practice architecture and advances wider disciplinary knowledge through research and teaching[3]. These two aspects of architectural education are both complementary and in tension[4]. Professional engagement typically occurs through the introduction of professional architects as tutors and guest lecturers, and working on 'real world' projects and briefs that simulate practice conditions creating unconscious bias towards the value of practice-based knowledge. The Cuba Street Studios were based on the proposition that this engagement may also be a means for the critical generation of disciplinary knowledge through engagement with practice-based modus operandi. This paper teases out results from the professional and academic design-led research practices to illustrate particular characteristics and tendencies of the studios in order to augment the potentials of professionally engaged future design teaching.

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[1] 185 people from 17 nationalities died in the Christchurch earthquakes. In almost every case they were killed directly or indirectly by the buildings that collapsed on them. See *Once in a lifetime; City building after Disaster in Christchurch*, edited by Bennett Barnaby, Dann James, Johnson Emma, Reynolds Ryan, Freerange Press, Christchurch, 2014: 18.

[2] Public meetings, lectures, and exhibitions occurred on the 26 July and 19th Nov 2012, 17 July and 7th Nov 2013 VUW Te Aro Campus, Wellington Town hall 26-28th April 2013, 8th April 2014 and 21st March 2014 Whanganui, Heritage NZ Central Region New Plymouth 5 Oct 2014, Conference presentations to NZIA conference 21 March 2014, AASA – Association of Architecture Schools of Australasia, 2-3 October 2015.

[3] Architecture teaching programmes are subject to regular professional review to ensure that their content and delivery are acceptable as a basis for graduate students to enter the architecture profession. In New Zealand this occurs through the Registered Architects Board and its professional programme reviews in reference to the Australian Institute of Architects National Competency standards in Architecture as a basis for registration as an architect under the New Zealand Registered Architects Act 2005.

[4] Peter Rowe, "Shaping Design Education", in William Saunders, *Reflections on Architectural practices in the 1990's*, Princeton Architectural Press, 1996, 242 (is typical of the well traversed discourse in this area).

Description of the Studios

In 2011 after the Christchurch earthquakes, the potential in Wellington for similar catastrophic damage to buildings and loss of lives was apparent. This prompted two student projects focused on Cuba Street, part of the immediate environment of the Victoria University of Wellington (VUW) School of Architecture.

The studios were framed as an opportunity to critically revisit perennial architectural problems associated with working within and alongside existing building form, structure, space and fabric. Essential to the project were inherent issues of assessing design quality in whole and in part as a means to discuss architectural heritage, and in particular, the architectural qualities and values of heritage and how these may be worked with and against. A theoretical context was provided through a range of readings including the key text *Moments of Resistance* that includes the essay *Binding Issues and Critical Strengthening* by Michael Ostwald[5].

Figure 1 (left). Lower Cuba Street buildings.
Figure 2 (right). Upper Cuba Street Buildings June 2012.

The precinct is designated as the Cuba Street Character Area in the City Plan and has a collective formal heritage status with Heritage New Zealand. There was also widespread ignorance and apathy in the student and wider community about the nature, extent and urgency of the local seismic resilience problem, the need to structurally upgrade most of the existing buildings, and the extent of the architectural opportunities inherent in the problem. A crude understanding of the problem as a non-architectural, purely engineering and economic matter was accentuated by a level of antipathy towards local government-enforced strengthening, and a perception by building owners and engineers that there was a lack of architectural need and opportunity associated with the heritage designation.

VUW School of Architecture, along with Wellington City Council (WCC), Heritage New Zealand (HNZ), and a group of owners, recognised the potential of focusing VUW student architectural research on this urgent architectural problem. WCC wanted to raise awareness of the need to seismically upgrade most of the buildings in Cuba Street, and the range of ways this might occur. VUW created an opportunity to simulate a real world

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[5] Michael J. Ostwald, *Binding Issues and Critical Strengthening* in Mark Taylor, Julianna Preston and Andrew Charleson. *Moments of Resistance.* 2002. Archadia Press, Sydney, 23-50.

research-led design studio to address disciplinary knowledge at the same time as meeting the architecture programme accreditation need for an integration of design and technical competencies. Heritage New Zealand was concerned about the potential loss of a significant amount of heritage building fabric, and the public perception that there were few options available for building owners faced with the significant cost of upgrading their buildings. The student projects briefs were ambitious, considering implications of the seismic issue at a building and city precinct scale for all of the buildings on both sides of the ten-block length of Cuba Street. The larger intention was to simulate the effects of major development on the entire precinct of the city as a means to create a collective vision of a part of the future city, and to expand the discourse around the potential range of architectural approaches to the heritage and seismic retrofit issue.

The students designed a redevelopment for every building and site. They also considered wider and innovative design questions associated with clusters of related new and old buildings, potential intensification, and new work triggered by the need for seismic upgrades. An architectural practice working method was adopted where students worked in project groups. They collectively drew existing buildings to document the entire site with the consistency and clarity expected in professional practice as a means to deeply engage with both the extant built fabric they inherited, and its comparative value. Extensive urban mapping[6] and existing condition documentation was created in groups that required cooperation to produce a series of related compatible outcomes, and share the workload. Digital and 1:100 physical models of the entire street and its existing individual buildings were made as a starting point.

Figure 3. Collective Street Elevation Upper Cuba Street.

The students' documentation of the existing conditions of each building drew from free access to WCC's extensive plan archives. Students also made diagram-based critiques and adaptations of the WCC planning rules as they applied to the sites, and undertook Heritage Assessments and Condition Reports with expanded analysis for each existing heritage building and its fabric. This detailed student research then provided a basis to manipulate, modify and remove heritage fabric in whole or in parts. Student Thomas Strange noted *I decided to replace this building. My research showed few historically or aesthetically redeeming features. And don't you think the original Victorian roof lantern on the building next door is much more intriguing?*[7] These methodologies were far from procedural, neutral, or technocratic. They created significant architectural learning opportunities through drawing out deep

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[6] 36 separate categories of urban mapping were investigated by each student group in a manner that co-ordinated student graphic conventions and that covered the entire urban precinct.
[7] Thomas Strange, quoted by Jacqui Gibson, *Future Perfect*, Heritage New Zealand, Autumn 2013, 29

student critical judgement of existing architectural contexts. There was also significant added value to every student from the exchanges of foundational information and working techniques with each other. Students quickly learnt the value of focused team work in terms of both the peer-to-peer learning and the scale of the local, group, and combined outcomes.

Figure 4 (left). Cuba Street Model Nov 2012.
Figure 5 (right). [Re]Cuba Model Nov 2013.

Stakeholder meetings with students and owners in Cuba Street were facilitated by WCC. Formal presentations about the project were made to Cuba Street building owners and the public by VUW, WCC and HNZ staff. The design studios also integrated teaching collaborations across parallel technology courses. As part of their architectural designs the students designed and integrated seismic retrofitting schemes to meet the requirements of the Building Act and the parallel Integrated Technologies courses. Structural, construction, and services knowledge was integral to seismic and architectural retrofit schemes for individual buildings and the clusters of buildings, including the intensification and the new work. The structural assessments and proposed seismic upgrade designs findings were made available to owners through the VUW architecture library. It is rare for clusters of buildings to be tied and seismically retrofitted together, so this phase of the project developed important new research around the potentials of buildings to structurally support each other. This was a contribution to the field that has been subsequently recognised in several forums, and published in a separate national engineering publication[8].

Outcomes of the studios
A rich range of context-specific design outcomes emerged. These interwove retrofitted structure with existing and proposed new building fabric. Students had worked in close

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[8] Andrew Charleson, Mark Southcombe. "Strategies for the seismic upgrading of pairs of buildings in a historic precinct"*, Bulletin of the New Zealand Society for Earthquake Engineering* Vol. 50, n. 1 (March 2017): 50-58.

relation with their peers and demonstrated their engagement with context by showing adjacent work of their neighbours in their drawings. This structured mode of representation facilitated consideration of the effects of their work on the precinct and in relation to wider urban issues that had been identified in earlier group work. A composite 10m long Cuba Street model was created incorporating every student project. The composite model communicated a collective vision that individual models could not, and it was very effective in communicating the vision for change in the precinct, and the range of its potential architectural approaches. The wider urban and architectural findings were disseminated through a number of invited public presentations in several New Zealand cities, in exhibitions, and through publications.

The design studios integrated teaching collaborations across parallel technology courses. As part of their architectural designs the students designed and integrated seismic retrofitting schemes to meet the requirements of the Building Act and the parallel integrated technologies courses. Structural, construction, and services knowledge was integral to seismic and architectural retrofit schemes for individual buildings and the clusters of buildings, including the intensification and new work. It is rare for clusters of buildings to be tied and seismically retrofitted together, so this phase of the project was important research into a new field.

A rich range of context-specific design investigations emerged. These interwove retrofitted structure with existing and new building fabric. Students worked in close relation to their peers prompted by a requirement to show peers' work as adjacent contexts in their drawings, and to consider the effect of their work on the wider precinct. They also created a composite 10m long Cuba Street model incorporating each of their proposed projects. The composite model communicated a collective vision that individual models could not, and it was also very effective in communicating the potential for change in the precinct to a wider audience.

Discussion

The inputs to the project from the range of partners, consultants and stakeholders loosely occurred in the manner of a professional office-based project. Through the project students extended their depth of understanding of the architecture of the Cuba Street precinct in a direct manner analogous to the predesign phases of professional architectural practice, but also informed by their wider precinct urban investigations and analyses. They experienced the implications of their documentation accuracy in relation to a comparatively strict brief and their earlier design decision-making as they worked over, and then shared their earlier work. This achieved standards of documentation and student engagement in both project and process rarely seen within the university[9]. The level of engagement with representation and design limitations and opportunities was different to that of practice because of differences in the levels of site access, expertise and resources available in an equivalent practice context. This played out as a relative freedom and lack of student accountability to the professional consultants. There was also another factor at play; the structured accountability of students to their peers through the sharing of their project outputs with neighbouring students and the collective student group. Student project positioning relative to the wider student group and its specific theoretical context clearly had a major effect evident in the wide range of student approaches explored from conservative and pragmatic heritage conservation through to seriously radical reworking of heritage fabric and complete

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[9] The formal feedback from professional tutors in the end of course incorporated in the report to management noted. "The design detail was resolved to a higher level of sophistication and resolution than expected, with some professional tutors noting this could be increased further".

demolition. The project facilitated a range of speculative design investigations and operated somewhere between professional and critical contexts, through addressing both the project detail and wider disciplinary framing.

The level of student engagement was also facilitated by the immediacy of the context. Many students in the cohort were directly affected by the Christchurch earthquakes, but all students were very familiar with downtown Cuba Street adjacent to the VUW schools of Architecture and Design campus. They readily appreciated the danger and immediacy of the problem, and that it affected the community seriously, including themselves. This context was very familiar to students, and the immediacy facilitated the testing of their ideas by direct comparison with the physical context they were designing for. Their engagement with owners and other affected parties and the publication of their work created the opportunity for their projects to be more than theoretical, and for their work to have a role helping address a key issue effecting the community.

The introduction of structural upgrading work required for the earthquake-prone heritage buildings into the design process was also a learning focus for the parallel technology course. The students discovered that seismic upgrading is interwoven with architectural implications and unable to be separated from them[10]. The extensive making-good and the remodelling associated with seismic retrofitting also triggered consideration of fire ratings, escape provisions, and accessibility enhancement. This created productive constraints that interacted with student design intentions, constraining and developing depth and quality of their design work in professional terms, and providing a context for critical development of the design and construction detail. The implications of technical requirements for design were addressed by students to an extent greater than usually possible thanks to the integration of the design and technologies courses and inputs from a large range of professional mentors and experts partially funded by the WCC.

There remained a difference in the significantly reduced level of detailed design that was able to be achieved within the academic context compared to what is possible in a professional context. This is as much an opportunity as a limitation. The student projects focused on individual design responses, but were also required to articulate a wider relationship to their disciplinary contexts; a wider architectural significance. In this case, the project dealt with questions regarding architectural opportunities associated with seismic upgrading and adaptive reuse of heritage building fabric. The deep connection to a real context with the ability to experiment free from the weight and insistence of a professional practice, created a wide range of alternative solutions to the one problem. The testing of a variety of solutions had a collective significance beyond the individual cases and this is the key difference to architectural outcomes in professional practice. Through a collective design-led research engine multiple engagement with the problem enabled the design, documentation and testing of a range of new strategies for seismic retrofitting clusters of buildings. It also enabled the design and modelling of a significant future vision for a whole part of the city. Subsequent publications relating to this studio project reflected on and theorised the range of architectural approaches possible to seismic retrofitting, and the synergies possible between clusters of buildings seismically retrofitted together[11], and the heritage implications of seismic

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[10] Mark Southcombe and Andrew Charleson. *[Re] Cuba: renegotiating seismic resilience in Cuba Street Wellington.* Wellington City Council, 2014, 99.
[11] Mark Southcombe and Andrew Charleson. *[Re] Cuba: renegotiating seismic resilience in Cuba Street Wellington.* Wellington City Council, 2014, 14-17.

retrofitting[12]. This wider dissemination of disciplinary critical reflection of design and research significance rarely occurs in practice where the discussion is skewed by the market[13].

Through processes of working together, students also identified wider design opportunities for better urban design solutions. Collaborative aspects of the student project attempted to simulate an office environment through work in groups focused on a wider urban context of adjacent projects. This aspect of the academic project amplified student efforts through some shared predesign work and contextual information. They experienced added value to their projects through teamwork as noted by student Hamish Byrne…*he and other students talked a lot about the relationships between their buildings, with the aim of making them work together aesthetically and functionally. He and Thomas, for example, collaborated on the redesign of a public space at the rear of the building, accessible from Glover Park* [14].

There was significant complementary production that added value to individual student work by sharing relevant research and documentation. This was particularly evident when the work of all 75 students in the cohort was combined in a series of combined street elevation drawings, and exhibition models of the entire future street designs.

These urban resources were valuable both to the student and wider public understanding of the shifts in existing urban patterns within the precinct. This was a distinctive outcome of the studio. Another example of the outcomes of this wide scope precinct research was the discovery of the importance of the underlying historical tiny scale site sizes to the somewhat grungy occupation of the precinct. This augmented the conventional understanding of the precinct character as arising not only from the poor condition of many of the buildings, but also from the unique range of small-scale tenancies. A diversity of vertical building scales was introduced as a tactic to help protect and at times recover and develop this Cuba Street specific urban character. Identifying these urban design characteristics and tactics to retain and augment key aspects of the genius loci was an unexpected and a valuable outcome for the WCC studio partner.

The amount of community engagement over the extent of the project was also noteworthy. Public meetings, public lectures, presentations, several public exhibitions and several academic publications occurred. The project took on a life of its own, attracting significant interest from the Cuba Street building owners and the wider New Zealand community. It achieved the objectives of raising public awareness of the seismic resilience issue and expanding the discourse around the range of potential solutions possible, particularly the potentials of major adaptive reuse and hybrid new-old building types.

A separate book project funded by WCC documented the collective analysis of the full length of the street and surrounds, individual and cluster case studies, and included an essay theorising an expanded range of architectural approaches to seismic retrofitting architecture[15]. The [Re]Cuba book is a major, publically accessible reference and resource demonstrating approaches to urban renewal and the seismic retrofitting of heritage buildings.

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[12] Jacqui Gibson, *Future Perfect* Heritage New Zealand, Autumn 2013, 28-33.
[13] Martin Pawley, "The Strange Death of Architectural Criticism", in *The Strange Death of Architectural Criticism. Martin Pawley Collected Writings*, Black Dog Publishing, 2007, 330-331.
[14] Hamish Byrne, quoted by Jacqui Gibson, *Future Perfect* Heritage New Zealand, Autumn 2013, 33
[15] Mark Southcombe and Andrew Charleson, "Renegotiating the Architecture of Seismic Resilience", in *[Re] Cuba: Renegotiating Seismic Resilience in Cuba Street Wellington*. Wellington City Council, 2014, 14-17.

Figure 6 and Figure 7. [Re]Cuba Collective model Web Street end and Wakefield Street end 2013.

The large collective model exhibitions of research outcomes had significant impact upon the public, beyond that of smaller less engaged projects. They were exhibited in public venues in the city in response to external requests[16]. The project's wider reconsideration of the architectural implications of seismic retrofitting was public in nature, open, accessible, and promoted discourse. It created new knowledge and was documented though a variety of media. In contrast, professional practices even for public bodies occur through processes serving a particular client, their terms of reference, needs and preferences.

Conclusion
The collaboration between VUW, WCC, and HNZ, along with the inputs from professional Engineering and Architectural tutors, modelled a team approach to urban design and seismic retrofitting similar to a multidisciplinary office team. The knowledge exchange that occurred

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[16] The New Zealand Society of Earthquake Engineers, the Wellington City Council, and Heritage New Zealand.

through this process contributed significantly to the student engagement with the problem and the detail and quality of the student design results. It simulated a professional environment, informed design work, and shifted presentation in the direction of professional standards. Design work was also resolved with an increased level of detail sophistication and resolution over that achieved without professional mentorship. Students learnt from each other, and about how to work efficiently and effectively together. This was a significant pedagogical outcome in a teaching programme focused primarily on individual learning, and subject to the overview of a profession that operates through collaborative effort. Characteristics of professional and academic practices are significantly different even where academic practices attempt to simulate professional practices, and this affects the potential learning and sorts of outcomes that can be expected from them. Student abilities, the resources available and an academic context also play a role even when 'real world' briefs are simulated and extensive base information is provided and created as a part of a project, as occurred in the Cuba Street projects.

Understanding strengths, weaknesses and potentials of the different expectations and modes of operation in architectural education and professional practices is key to maximising the potential effectiveness of professional engagement were it occurs within architectural education. There are potential pedagogical, community and disciplinary impacts from a series of related and collective outputs to design investigations. These were experienced by the students who were directly implicated in the design context and maintained a high level of engagement throughout its progress. When a range of design-led research responses are coordinated as part of a single larger research project, the wider implications of the research can be demonstrated through comparison of related projects. These collective outcomes clearly have the potential to expand the level of engagement, not only of the students but also for the wider disciplinary and local communities. This occurs through the collective framing of the research, the breadth of the teasing out of an architectural question, the range of solutions generated, the collective manner of project representation, exhibition and publication, and the interaction with the host and wider communities through presentation, exhibition and publication.

The project outcomes covered an entire city precinct. The specific learning outcomes included awareness of efficiencies and architectural synergies from; seismic retrofits undertaken by architects with engineers, projects considering of clusters of neighbouring buildings, and from collaborative redevelopment introducing shared public laneways. The series of interactions before, during and after the period of the projects created a ripple of impacts through their associated seminars, exhibitions, lectures and publications. As a result, there is increased public awareness not only of the need to seismically retrofit local heritage buildings, but also of the value of architects' involvement in the problem, and the range potential architectural opportunities inherent to the problem, and their potential synergies. This type of broad urban, detailed, yet speculative investigation is rarely possible in practice where a project is limited by its client terms of reference and financial exigencies. The project created learning opportunities in association with studio partners' complementary objectives. Iterative implications of multiple alternative solutions were able to be explored in great breadth. The speculative freedom of the theoretical project also allowed the possibility to investigate the broad implications of the seismic retrofit architectural problem in a significantly wider manner than occurs in practice, and to draw new conclusions about the architectural implications of seismic retrofitting.

Re-solved. Iterating design solutions by understanding failure

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Abstract

Design is considered one of the most important parts of an architectural education. Much emphasis is placed upon the Design Studio within a School of Architecture, yet in the traditional tutor/student model how much opportunity is there for the student to understand the process of designing when emulation forms the heart of the learning? This paper reflects upon a series of large scale fabrication projects offered to students from 2012-2014 in Christchurch, New Zealand, under the umbrella of FESTA. These projects challenged the students to confront a series of 'firsts'; to work collaboratively, to present themselves professionally, to navigate regulatory bodies, to engage with a client, and to realise a project at full, one to one, scale.
These projects tend to exist without a specific precedent for students to draw upon, as would be usual when designing one of any number a normal building typology. This forces students into a space of discovery, one where a design can change for any multitude of reasons. Students are moved from the usual Design Studio experience of problem solving to one where the situation is uncertain and problematic, to a space of problem setting.

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The majority of a student's time in a school of architecture will be spent toiling away in the design studio. Given the vast amounts of time spent on this part of an architectural education it would be easy to surmise that designing is the most important skill that a student can learn. The importance placed on design would suggest that we believe that the act of designing can be taught, that when a student leaves his or her education they will be a better designer than when they entered[1].

A key part of an architectural education in the usual design studio environment is one of emulationP1F[2]P,. Students are required to research precedents of a typology or topic and extrapolate a response to a specific design brief. The design studio is headed by a studio master to whom students will present a series of responses for individualised critique and subsequent advancement. This back and forth will occur until such time as a level of competency is determined as achieved by the student or until the project deadline arrives. Other than the reliance on the feedback of the studio master or learning from precedent studies there is little to guide the student in advancing their project. The learning could be considered passive with little active engagement from the student required in the process. Students are, as Donald Schön puts it, problem *solving* rather than problem *setting* and as such, have little opportunity to understand the process of designing.

> "From the perspective of Technical Rationality, professional practice is a process of problem *solving*. Problems of choice or decision are solved through the selection, from available means, of the one best suited to established ends. But with this emphasis on problem solving, we ignore problem *setting*, the process by which we define the decision to be made, the ends to be achieved, the mains which may be chosen. In real-world practice, problems do not present themselves to the practitioner as givens. They must be constructed from the materials of problematic situations which are puzzling, troubling and uncertain."
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> Donald A. Schön, The Reflective Practitioner: How Professionals Think in Action (New York: Basic Books, 1983), 51-52.

It is curious that architectural studio teaching in its usual form tends to limit students to seek and apply solutions to a known problem of an architectural typology. We know that students will tend to produce the obviousP2F[3]P and this will reduce their capacity to understand at a meaningful level what is being asked from them. There is another approach to the design studio, one that places design-led research at the front of an architectural question to engage students in a way that empowers them in the process of not only solving problems but also in the setting of design problems. This can be facilitated by the 'live project'.

Ruth Morrow discusses the relationship between Design Studio projects and Live Projects, in particular, that Live Projects may be set up to serve a different role from Design Studio

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[1] Michael Brawne, "Can We Describe How We Design?" in, *Educating Architects: How tomorrow's practitioners will learn today,* ed. Neil Spiller & Nic Clear (New York, New York: Thames & Hudson, 2014), 72.

[2] Mark Morris, "School of Thought," in *Educating Architects: How tomorrow's practitioners will learn today,* ed. Neil Spiller and Nic Clear (New York, New York: Thames & Hudson, 2014), 171.

[3] Professor Sir Peter Cook, "Timing is everything… or is it?" in, *Educating Architects: How tomorrow's practitioners will learn today,* ed. Neil Spiller and Nic Clear (New York, New York: Thames & Hudson, 2014), 23.

projects.[4] We agree that Live Projects introduce students to a range of alternative skills, particularly around collaborative agency. And by situating the following case studies within a community situation, we see how the role of people in the design process, the client and end user, contribute to challenging any presumptions students might have about their projects. In these projects students are taken outside of the usual design studio environment in order to contribute to the reinstatement of an urban environment in the recently devastated Christchurch CBD. In creating objects and places for people to engage students encounter problems of real significance. They are put into the position of 'problem setting', into a process of iterating design solutions or, another way, of re-solving architectural problems.

FESTA Large Scale Fabrication Studios
The large scale fabrication studios undertaken as part of the Festival of Transitional Architecture (FESTA) presented an abstract problem to students to solve, namely to realise temporary architectural projects at a city scale for public consumption for a single night. The students were drawn from architecture and design departments at the University of Auckland (SoAP), Christchurch Polytechnic (CPIT), Auckland University of Technology (AUT), Victoria University of Wellington (VUW) and Unitec.

Figure 1. Peter McPherson, *Archrobatics, Team Tensile, Altitude*, LuxCity, 2012.

In each of the programmes (2012, 2013 and 2014) the installations required interaction with the public as well as engagement with a local client. In every case projects started out with a zero-dollar budget. Many 'firsts' occur in this project; the first time students are required to work collaboratively, the first time students present or market themselves externally, the first time students negotiate council regulations, the first time students engage with a client, the first time students realise a project at full scale and, the first time end users will pass judgment on their work.

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[4] Ruth Morrow, "Foreword. Live Project Love: building a framework for Live Projects" in, *Architecture Live Projects: Pedagogy into Practice,* ed. Harriet Harriss and Lynnette Widder (New York, New York: Routledge, 2014), xvii-xxiii.

These 'firsts' are of course generalisations but serve to contextualise where the project sits within a student's education and the multitude of new challenges that are faced with such a task. They also highlight where the regular studio experience, which focusses on the individual, might exclude exposure to a number of necessary skills required by students for their professional careersP3F[5]P. Additionally, in having very little precedent for the outcome there is an emphasis placed on discovery, on the iterative nature of the design process as new challenges are faced and solutions pursued.

The focus of this paper is on the programme offered in 2012, the first iteration of the projects with FESTA. As the FESTA event evolved over three years so too did the framework within which the projects sit, largely driven by stricter council controls. These first projects then offer greater diversity to choose from when analysing the student approach.

Small teams of students, 4-6 in number, initially presented preliminary research and exploration to a jury panel. Students were encouraged from the outset to make things and explore the physical properties of light and materials. This led to a number of highly inventive ideas at a conceptual level with a great capacity to be scaled up to a city sized realisable structure. Through working with a variety of media and scales students are able to better understand the full consequences of their design decisions. What begins as a small jelly cube with a light inside (and perhaps questionable architectural value) might come to be an entire interactive field of light for people to walk through.

Figure 2. The Wobblers, *Concept Design*, LuxCity, 2012.

The projects undertaken in Christchurch required economy of means. The projects had to be transported from Auckland to Christchurch (ideally within the standard airline luggage limits), be erected within a day for a single night event and then removed without trace of waste at the end of the night. This moved students into the direction to explore the qualities of light and lightness, both the medium of light and materials with physical light-weight characteristics.

The following case studies examine some of these issues.

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[5] Mark Burry , "Making a difference: Embedding academic research in practice" in, *Educating Architects: How tomorrow's practitioners will learn today,* ed. Neil Spiller & Nic Clear (New York, New York: Thames & Hudson, 2014), 327.

Silhouette Carnival

Figure 3. Peter McPherson, *Silhouette Carnival*, LuxCity, 2012.

The initial concept for this project was established by a group of Chinese International students based on their understanding of traditional Chinese Shadow Theatre. The project used the notion of projection of a light source onto a body so that the silhouette could be viewed on a translucent surface. This meant that the origin of the light could be small but had the challenge to construct a suitable surface onto which the silhouette could be viewed.

The initial group were combined with a group of students whose original project sought to create free-standing objects from construction materials, drawn from the concept of the Terrain Vague. The two teams were merged due to complimentary skills and also as each project offered possibilities for exploration to the other.

Figure 4. Silhouette Carnival, *Concept Design and Development*, LuxCity, 2012.

With the lighting aspect of the project generally understood, the combined team set to explore methods for constructing free-standing projection screens. This necessitated engaging with issues of construction at an early stage to test how materials would react in an external environment. The initial layout for a concentric arrangement of planar elements began to give way to more three-dimensional shell type structures that an 'actor'

could inhabit. This began to work with the associated client for the project, the Free Theatre Christchurch who began to programme activities that would engage with the built structure. New challenges were added by where structures could be picked up and moved yet still remain free-standing when not in use by the actors.

Another layer of detailed design exploration was therefore required to examine how the structure would connect to the ground. The project site shifted from sealed to unsealed surfaces several times as negotiations regarding the overall project boundaries ensued. A solution that could meet either condition was required.

As the design developed the footing connection began to inform how the overall shell structure could be formed, with curved members springing from a single point. With a basic shape becoming finalised, further criteria for the material investigations for the shell covering were established. The group established the parameters by which the material needed to perform; the ability to receive and transmit a shadow, to warp and twist to a form, to absorb and allow wind to pass through and, to give some element of rain protection. Experiments again were undertaken initially at a scale model level and then at half and full scale realisations.

Figure 5. Silhouette Carnival, *Concept Design and Development*, LuxCity, 2012.

Throughout the process students realised the need to gain new skills for construction as well as learning how materials and means of fabrication will affect design decisions. Some learned to sew while others to weld and all of them to tie knots! The success of this project could be measured at many levels; the integration of two design concepts and cultural backgrounds provided a fertile environment for growth and learning from one-another; the ability for the design to respond to a variety of physical conditions including a last minute change of site; and the ability for the project to remain successful at a social level by enabling public engagement when in the final moments it became apparent that the client wouldn't be able to partake in the event.

Reflecting on the work carried out by this group of students we clearly see them setting themselves problems to be re-solved, a critical aspect of learning to understand the design process. Alongside this the number and variety of solutions presented emphasise how iterating enabled the students to solve the problems they set themselves in their realisation of a large scale architectural installation.
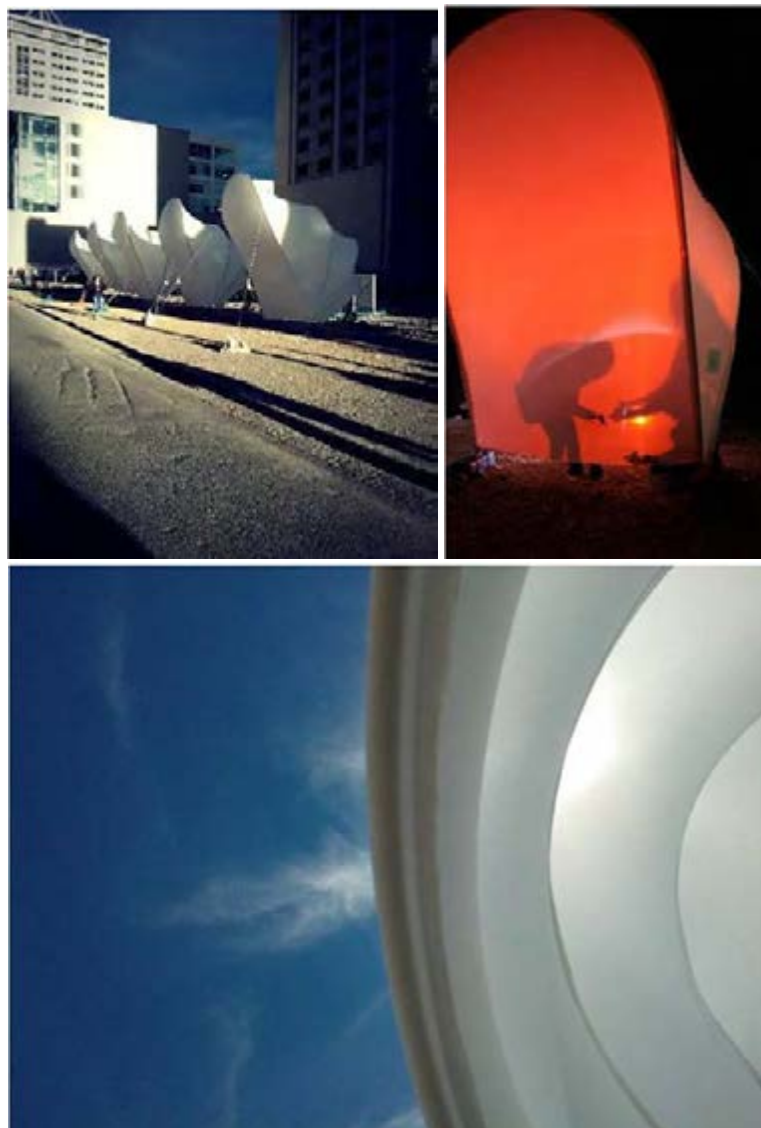
Figure 6. Peter McPherson, *Silhouette Carnival*, LuxCity, 2012.

Archrobatics

Figure 7. Peter McPherson, *Archrobatics*, LuxCity, 2012.

The team Archrobatics started life as Spherical Sounds, a scheme utilising glowing spheres to illustrate the call of a Tui, a native New Zealand bird. The intent was to create a structure suspended overhead, establishing an environment below for the public to engage with. This project underwent the most radical of formal transformations of all the groups and finally resulted in a beautiful elegant structure.

Figure 8. Archrobatics, *Design Concept*, LuxCity, 2012.

In working through variations of their initial design proposal the idea that appeared achievable at a small scale was becoming unwieldy at full size. In setting about resolving the design challenges presented by the initial scheme students concluded that it was proving too expensive and unreliable to construct, not to mention posing physical danger, and the group came to the conclusion that a change in direction was necessary.
With a focus on achievability and simplicity the group looked at a single point of vertical suspension from what would be a crane hook, 30 plus meters above the ground. The pyramid type structure that was emerging was used to suspend the spheres from the initial

concept within. At this time a rigid structure with steel cables was imagined with the spheres being the light emitting object. As continued exploration into materials, including the spheres and alternatives were undertaken, a decision to omit the spheres altogether and focus on the shapes that could be formed by the structure itself was made. As considerations regarding site and flexibility were also included greater levels of flexibility were considered and explored for the overall structure eventually resulting in rope forming the guiding members. In testing materials criteria were established by the group where wind loading would be the dominant factor given the height of the structure, along with lightness, the ability to accept light cast upon it from LED light sources and the ability to flex and hold a shape under tension. The group eventually settled upon agricultural bird netting.

Figure 9. Archrobatics, *Developed Design Concepts*, LuxCity, 2012.

Grounding the structure was another design challenge, met mostly through the use of deadman weights but also through the filling of empty sacks filled with rubble from the site itself. Through testing of the construction technique using rope, netting and lights and a variety of scales and settings the group were confident that they could quickly erect and adjust their full scale scheme onsite.

Figure 10. Peter McPherson, *Archrobatics*, LuxCity, 2012.

The particular success of this project lay in students' ability to identify there being an issue with the initial design proposal. What might be considered a failure provided the basis for the group to better understand their constraints, establish priorities and reset their design problem, demonstrating their learning from earlier setbacks. Learning from failure is an important aspect of design and failure can be considered a success if students are able to demonstrate learning from it.[6] Failure additionally highlights to students that design solutions can change for any number of reasons, again encouraging them to iterate in their design thinking. In being able to re-establish and re-solve the design problem, goals and objectives, the group was able to achieve one of the most successful outcomes of the evening. All material was transported on the aeroplane, the project was erected in a short period of time with site specific adjustments to the overall shape incorporated and de-installation of the project took moments with zero waste left behind, save for what was already found onsite initially. The project itself had an ephemeral quality to it during the daytime and as day turned to night the beauty of the three hyperbolic forms came to life on a city scale.

Conclusion

The two case studies presented here are examples of live, situated and community based projects that highlight to students two key components of the design process; iteration and failure. In exposing students to these types of projects, failure becomes a core part of the learning. Failure is critical in the resetting of the design problem and hence, in empowering students to engage with and develop their own design problems. In understanding failure in the context of their own parameters the reasons to alter a design, to iterate, become more tangible to students than in the usual design studio environment. In better understanding the reasons for altering a design alongside the setting of their own design problem,[7] students become more engaged and aware of their thinking and process. This is in contrast to the traditional student and mentor design studio relationship where design is guided and the student can remain removed from the process of understanding the problem. Students are instead able to challenge what an architectural outcome might be for a given situation.

A key component to establish understanding of the architectural problem is the production of an architectural object, to be used by others. This moves students outside of the usual teacher-student learning relationship and the realisation of the architectural object becomes[8] linked to the design process itself, the distinction between design and process blurs[9] with the two becoming linked in the student's mind.

Through an open brief that demands a real architectural outcome to be placed within a community we find a model of design studio that emphasises the adoption of critical skills required to be a successful designer. Specifically, the necessity to iterate a design problem, to fail and to understand those failures within set design problems of one's own making. These projects equip students with an understanding how to set problems and, how to resolve them.

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[6] Harriet Harriss, "Co-Authoring a Live Project Manifesto," in Harriss and Widder, *Architecture Live Projects*, 45.
[7] Schön, *The Reflective Practitioner*, 51-52.
[8] Donald A. Schön, The Reflective Practitioner: How Professionals Think in Action (New York: Basic Books, 1983), 51-52.
[9] James Benedict Brown, "Learning Theories for Live Projects," in Harriss and Widder, *Architecture Live Projects*, 22.

VIEWPOINT

FESTA Festival of Transitional Architecture in Christchurch, New Zealand

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Figure 1. CityUps, FESTA 2014. Photo: Erica Austin.

In 2012 FESTA[1] emerged in Christchurch, New Zealand as a collective response to the extraordinary circumstances of a natural disaster. As a place-based (and now biennial) weekend-long festival of architecture and urbanism it continues to seek and find relevance to that place, its people, and to all involved in the event (participants, audience, funders and supporters) as the extraordinary fades into a more ordered and ordinary existence.

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[1] http://festa.org.nz/. Accessed October 1, 2017.

On 22 February 2011, a large earthquake hit the city of Christchurch, New Zealand. It was the second largest, and most destructive, of a series of over 11,000 earthquakes recorded in the region over a 2-year period from September 2010. 185 people died as a result of the February quake and over 75% of the built fabric of the central city was demolished. Christchurch's central city was cordoned off from the public and put under army control, portions of it for over two years. A new government agency was established to direct the city's recovery. It commissioned and backed a new spatial plan for the central city ('The Blueprint'[2]), designed to retain existing land values and incentivise new and current investment as well as renew public spaces and amenities. Land damage caused whole suburban areas to be deemed unrepairable and these neighbourhoods were 'red zoned'[3] and purchased by the central government. Over 4 years, 8000 homes in the suburban red zones were demolished. Drastic change and uncertainty touched most aspects of Christchurch people's lives in the years following the earthquake.

Amid the chaos and uncertainty of disaster, citizens[4] swiftly recognised the effect of losing their public buildings and institutions and the civic and cultural life they supported. The creative communities of Christchurch responded to this loss with activity in the form of myriad creative urban projects and spontaneous public events. These returned some cultural and civic life and provided positive reasons to gather in the vacant and changing public spaces of the city. New organisations spearheaded this adaptive urbanism. Gap Filler[5] drew on performance practice and theory as well as architecture, while Greening the Rubble[6] drew on landscape architecture practice. These two new groups weren't the only people active in this way as other artists, designers, community and arts organisations also ran independent temporary projects in unexpected places. The need for temporary urbanism and the desire for public participation led to the establishment of Life in Vacant Spaces[7] in 2012 as a site-broker for creative, temporary urban projects in the city.

Two examples provide an idea of the diversity of these urban interventions. In a city suddenly bereft of performance venues, Gap Filler's open-air, coin-operated Dance-o-mat[8]provided a surprising and accessible space for anyone to dance to their own music. Greening the Rubble's Nature Play Park[9] not only gave children a safe and welcoming space to play in an otherwise inhospitable demolition zone, it exemplified the city as people wanted it to be: greener, more natural, human-scaled, child-oriented and accessible. Christchurch's temporary urban and art projects weren't confined to people employed by these organisations. The groups and individuals engaging in emergent urban and artistic practice welcomed public participation and actively sought collaboration and volunteer involvement.

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[2] http://architecturenow.co.nz/articles/the-final-blueprint-for-a-new-christchurch/. Accessed October 1, 2017.
[3] https://teara.govt.nz/en/zoomify/46379/eastern-suburbs-red-zone. Accessed October 1, 2017.
[4] I follow Rebecca Solnit's definition of 'citizen': "members of a city or community, not people in possession of legal citizenship in a nation. Solnit, *A Paradise Built in Hell,* Penguin 2009, 2.
[5] http://gapfiller.org.nz/. Accessed October 1, 2017.
[6] http://greeningtherubble.org.nz/. Accessed October 1, 2017.
[7] http://livs.org.nz/. Accessed October 1, 2017.
[8] http://gapfiller.org.nz/project/dance-o-mat/. Accessed October 1, 2017.
[9] http://greeningtherubble.org.nz/our-projects/nature-play/. Accessed October 1, 2017.

There's something galvanising and socially transformative about a natural disaster. Rebecca Solnit writes about this in her book *A Paradise Built in Hell*. "What is this feeling that crops up during so many disasters? ....an emotion graver than happiness but deeply positive… [that provides us with] a glimpse of who else we ourselves may be and what else our society could become".[10] Solnit calls it a "reversion to improvised, collaborative, cooperative, and local society".[11] Christchurch people felt and experienced this. It is a desire, willingness and fresh capacity to create meaningful community, and with it, meaningful places.

The groundswell of social creativity and urban action knitted together new networks of people. In late 2011 and early 2012, two people on either side of the Tasman Sea independently suggested that Christchurch was a ripe place to establish a festival of temporary architecture: Christchurch experimental theatre producer and actor, George Parker (Free Theatre), and Melbourne-based futurist Stuart Candy (then at Arup). Uwe Rieger, Associate Professor of Architecture at the University of Auckland, proposed a headline event for the nascent festival based on installations designed and fabricated by tertiary students in architecture and design. A steering group of artists, designers, lecturers and those active in the 'transitional movement' was swiftly assembled. We began to formalise a structure. As an under-employed architectural historian with a passion for public engagement in architecture and urbanism, I was elected to direct the festival. Uwe Rieger brought a wealth of experience conceiving, teaching and producing 1:1 fabrications as public events, and others had a background in theatre, festivals and dance parties. Our inexperience at producing complex events at an urban scale (in a disaster zone) was compensated for by an energy spurred by the physical, cultural and political context. We were spurred on by the encouragement we received from prospective collaborators. And so FESTA was born.

Figure 2. Tens of thousands of people reclaimed the central city during LUXCITY at FESTA 2012.
Photo: Bridgit Anderson.

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[10] Solnit, 2009, 5-6.
[11] Solnit, 2009, 10.

The opening night for the inaugural Festival of Transitional Architecture (FESTA) in October 2012 was Studio Christchurch's LUXCITY. Against the dark background of the red zone 16 architectural installations by 350 design and architecture students from across New Zealand created a fleeting and enchanting urban atmosphere. An estimated 30,000 people filled this city made from light for one night making it a moving and historic event.

Figure 3 (left). In Your Face, a collaboration between local fashion boutique Definite Indefinite and University of Auckland students from the School of Architecture & Planning for LUXCITY,
FESTA 2012. Photo: Bridgit Anderson.
Figure 4 (right). Murmur was a thin, fragile canopy suspended from a crane so it shifted and swayed with the wind. Designed by students from the School of Architecture & Planning,
University of Auckland for LUXCITY, FESTA 2012. Photo: Bridgit Anderson.

Figure 5 (left). CPIT installation 'Illusion' created a secluded atmosphere for live jazz at LUXCITY, FESTA 2012. Photo: Bridgit Anderson.
Fugure 6 (right). AUT Spatial Design students created Halo, a human-scaled semi-circular arcade hung with glowing paper lanterns which were inflated by the breath of participants. Photo: Mark Gore.

LUXCITY, a city made from light for one night, was the headline event for the inaugural FESTA in October 2012. Set against the darkness of the evacuated central city, 350 design and architecture students from five New Zealand tertiary institutions designed and fabricated 16 architectural installations using light as their primary medium. The equipment that was demolishing the city by the day was used to provide structural support to LUXCITY's installations. Achieving an urban scale relied on sponsors donating machinery and expertise to run hundreds of thousands of dollars of demolition equipment

for free. With a backdrop of half demolished, damaged and inaccessible buildings, cranes, high-reach and telehandlers suspended an ephemeral and delicate architecture.

The spectacle of student-created live projects was fundamental to the event. However, LUXCITY was more than an exhibition of student design bravura. The event also involved the 'stuff of the urban scene' that was then absent from Christchurch's urban centre. We brought in collaborators for each studio project, who activated the installation sites with bars and cafes, performances, an all-ages dance venue, a live fashion show and a night market. The other key participants in LUXCITY were the public - an overwhelming number of people poured in to visit that night; crowd estimates ranged from 20,000-30,000.

Fugre 7. LUXCITY's principal medium was light and many of the projects used large-scale demolition machinery to support and suspend the installations. The machinery was generously donated by local companies Smith Crane & Construction, Leighs Construction, and Ceres Environmental. FESTA 2012. Photo: Mark Gore.

Having a participating audience made LUXCITY's promise of instant urbanity real through the crowd's interaction with the installations and activities, revelling in LUXCITY, making it dense and alive. For many people attending LUXCITY, it was the first invitation they had had to come into the city since the February 2012 earthquake 20 months earlier. It was an intensely emotional experience for many – as their attention wasn't first granted to the installations but to the once-familiar sights and places of their central city under the process of demolition and removal. A sense of grief and loss soon gave way to delight and amazement, as people had chance encounters with each other on the street, and became absorbed by the surreal and joyful presence of the architectural installations and urban activities. In that one night, Christchurch transformed to become what all cities are: an intensification of life. It might be too much to say LUXCITY felt messianic – but it briefly

brought light to darkness; hope and joy to a period of uncertainty and grief; celebration and a certain defiance to a tense political and social environment.

LUXCITY established the model and a 'signature' for FESTA's future headline events – the bringing together of tertiary student live project installations with local businesses and arts and youth organisations. Over the festival weekend a wider programme brings together intimate and smaller events, drawing on Christchurch 's new culture of collaborative temporary urbanism. FESTA co-founder Barnaby Bennett (UTS, Sydney) describes this "second kind of activity at FESTA [as] a programme of smaller public events such as workshops, book launches, exhibitions, openings, art projects, talks, walking tours, and other activities that enable engaged experiences to the public. Through these other events FESTA has developed networks and relationships with many other organisations in the city. FESTA has acted as a catalyst for the transitional movement and many of the major transitional projects have been planned by, for, or launched at FESTA."[12]

From its conception, FESTA adapted to the circumstances of the city. Politics, place and theatre expanded the range and ambition of the headline event for FESTA 2013. Free Theatre's Canterbury Tales used the activities and rituals that bring people together in an "active search for a sense of community". This time six student installations, six performance collectives, and a procession of giant puppets transformed the night-time emptiness of the city's most prominent public spaces. Production lead George Parker described it as "Taking Chaucer as a point of reference, in so far as it brings together the seemingly high and the low, the noble and ignoble, [to create] a carnivalesque mixing up of social roles and urban environments."[13] Canterbury Tales was a far more consciously and deliberate political statement against the command and control of central government than LUXCITY. It used artistic collaboration, performance and site-specific temporary architecture as ways to sustain the openness, spontaneity and community warmth of post-disaster settings that Solnit recognises as fleeting.

In 2013 Christchurch's 'transitional' culture was flourishing, with participants from a range of creative disciplines. It was also drawing international attention with coverage from Lonely Planet and the New York Times. This culture provided a strong and distinctive associate programme of events and projects over FESTA weekend to accompany Canterbury Tales. The programme included a tiny mobile cinema made from an advertising trailer, Agropolis, a new transitional urban farm, and a mobile sauna in a tent.

'The Future Will be Live' was the theme for FESTA's third outing in 2014: how small, experimental and temporary projects in the city could be used to imagine, speculate on and present live experiences of the future. For the major event CityUps, installations were both physical and digital, with digital speculations anchored in physical space via an augmented reality app. The future city was presented not just as a technological leap but also with structures and opportunities that allowed for new social relationships. As well as 13 architectural installations, CityUps included students working in visual arts practice that drew on relational aesthetics, and drew artist practitioners from Wellington who activated public spaces with street games that recreated those immediate post-earthquake conditions of strangers working co-operatively and having shared experiences

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[12] Barnaby Bennett, draft PhD Thesis in Architecture, University of Technology Sydney, 2017, chapter 4.
[13] George Parker, 'Time to bring an empty city to life', *The Press*, 21 October 2013,
http://www.stuff.co.nz/the-press/opinion/perspective/9309967/Time-to-bring-an-empty-city-to-life.

of joy and celebration. CityUps imagined future longed to learn from and carry forward possibilities from the recent past.

Solnit's thesis recounts the flourishing of alternative social behaviour and experiments in the absence of conventional structures and organisations in post-disaster situations. Gradually FESTA has become more conventionally structured in its organisation. The decision to become biennial in 2015 and present FESTA only in even years was borne of a desire to make the event more considered, less random and hurried in its production. In response to a broader call within the city for less 'transitional' activity and an increased focus on a 'permanent' recovery for the city, FESTA deliberately became more strategic. This was seen in the preparation of a strategic plan for the 2016 event, which considered the outcomes for the 'four bottom lines' (cultural, economic, environmental, social). This change is described by Solnit's question – as "emergent groups turned established…[can they] function with the same level of improvisation/creativity that once characterised their actions?"[14] At its core, FESTA is still conceived as an event that seeks new ways to create meaningful connections between and within communities and urban place in a co-operative and open way. We understand FESTA as providing a platform for city-makers and citizens to "imagine and experience Christchurch differently" and to create opportunities for the denizens of Christchurch to get directly involved in the remaking of their city.

Figure 8. University of Auckland School of Architecture and Planning, CHCH2061, CityUps, FESTA 2014. Photo: Erica Austin.

The city we wanted to imagine and experience with FESTA 2016 was one that was more sustainable and with greater social connection. 'We Have the Means' drew on the pioneering approach to sustainable design and city-making developed by Superuse

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[14] Solnit, 2009, 302

Studios[15] in Rotterdam. Adopting Superuse Studios's systems-based approach to sustainable design challenged students and project creators to use waste streams as physical materials for the basis of their project designs. While Superuse Studios design permanent buildings from reused materials, for 2016's major event Lean Means student studios needed to translate that resourceful design practice into temporary installations using lightweight and low-value reused materials. Plastic bottles and bags, expired lightbulbs and cardboard tubes were amongst the materials sourced and manipulated to create an experience of a resourceful city. Activation of these installations included the local social enterprise Rekindle[16], which staged public workshops and demonstrations of resourcefulness, taking underutilised and discarded natural waste materials and crafting useful everyday items from them.

Figure 9 (left). Massey College of Creative Arts with Julia Morison, *Pipe Dreaming*, Lean Means, FESTA 2016.
Photo: Peanut Productions.
Figure 10 (right). Ara School of Architectural Studies with Rekindle, *Hence/Zero* Waste Ōtautahi, Lean Means, FESTA 2016. Photo: Bridgit Anderson.

In the years since 2011, Christchurch's immediate disaster management phase gave way to recovery, and in 2017, it is now in a phase officially labelled 'regeneration'. As the city rebuilds, is there a future for FESTA in a non-disaster urban context? Through FESTA we understand the city best as a public good. While there remains a demand and a desire to sustain FESTA's practice of working with hundreds of architecture and design students to create a spectacle that attracts crowds in their thousands, we continually question what the Festival is and who it is for. The circumstances that birthed FESTA have changed. Disaster is no longer acute, the city is no longer on life support (or sliding to its grave), but our desire for creating meaningful community and meaningful places endures. How can a biennial festival continue to test and trial what that means and how it can happen? For our 2018 edition we're teasing out ideas of inclusion and diversity in city-making, questions about who a city is made for and who is involved in its making. FESTA remains sustained by a desire for "purposefulness, meaning, involvement and community" and for "an affection that is not private and personal but civic: the love of strangers for each

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[15] http://superuse-studios.com/. Accessed October 1, 2017.
[16] https://www.rekindle.org.nz/. Accessed October 1, 2017.

other, of a citizen for his or her city, of belonging to a greater whole, of doing the work that matters."[17]

Figure 11. Gap Filler's Cycle Powered Cinema and Grandstandium at FESTA 2014.
Photo: Erica Austin.

Figure 12. DJs Cease + Desist with Gap Filler, SuperWow Disco at the Dance-o-mat,
FESTA 2014. Photo: Chloe Waretini.

[17] Solnit, 2009, 306.

FESTA is an annual transitional urbanism festival with a programme of multi-disciplinary innovative, creative projects, events and community-based activities that build and strengthen the passion and involvement of local communities in the regeneration of the central city.

Figure 13 (left). Agropolis urban farm was launched during FESTA 2013 and hands-on learning opportunities were held there every day of the Festival. Photo: Jessica Halliday.

Figure 14 (right). Makeshift's Picture House, a cinema for two on wheels, made its debut at FESTA 2013 where it screened a short film every day of the Festival on the sites of former cinemas around Cathedral Square. Photo: Ed Lust.

Figure 15 (left). 100 people join Gap Filler to celebrate the activation of their Sound Garden project during FESTA 2013. Photo: Erica Austin.

Figure 16 (right). Fabricio Fernandes' Nomadic Sauna with its pine wood-structured, canvas-covered dome and pot-belly stove popped up on Manchester St for FESTA 2013. Photo: Ed Lust.

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of Technology

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