
Published 2015 by the
Higher Education Research and Development Society of Australasia, Inc
PO Box 27, MILPERRA NSW 2214, Australia
www.herdsa.org.au

ISSN 1441 001X
ISBN 978-0-908557-96-7

This research paper was reviewed using a double blind peer review process that meets DIISR requirements. Two reviewers were appointed on the basis of their independence and they reviewed the full paper devoid of the authors’ names and institutions in order to ensure objectivity and anonymity. Papers were reviewed according to specified criteria, including relevance to the conference theme and sub-themes, originality, quality and presentation. Following review and acceptance, this full paper was presented at the international conference.

Copyright © 2015 HERDSA and the authors. Apart from any fair dealing for the purposes of research or private study, criticism or review, as permitted under the Copyright, Designs and Patent Act, 2005, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the publishers, or in the case of reprographic reproduction in accordance with the terms and licenses issued by the Copyright Licensing Agency. Enquiries concerning reproduction outside those terms should be sent to the publishers at the address above.
Beyond Anticipation. Designing Climate Futures

Judy Rogers
RMIT University, Melbourne, GPO Box 2476V, Melbourne, Australia
judy.rogers@rmit.edu.au

Julia Werner
RMIT University, Melbourne, GPO Box 2476V, Melbourne, Australia
julia.werner@rmit.edu.au

This paper introduces an approach to learning and teaching that deals directly with complexity and uncertainty, using a landscape architecture design studio as an example to demonstrate process and outcomes. The overarching theme of the studio was climate adaptation or confronting and productively working with the uncertainty of climate change. Students were asked to consider how to move beyond precaution towards an approach that imagined and creatively embraced uncertain futures. Key questions addressed in the studio included: How can communities improvise and adapt to continuous change and uncertainty? How can we move beyond projection – or geographies of anticipation towards an approach to the future that engages with and harnesses uncertainty and continuous change? Part of a larger body of work the studio worked with a large scale, integrative design approach that does not distinguish between analysis and design but sees them as simultaneous, interwoven acts of a creative design process. The approach utilises intuition, emotion and empathy as specific and productive human ‘devices’ to tackle complexity.

The site for these explorations was the City of Glenorchy, Southern Tasmania. Located at the base of Mount Wellington, bounded by the Derwent River and crossed by rivulets, the city is characterised by a mix of industrial, commercial and residential development. Key climate change risks include increased frequency of hot days, extended heat waves, increased occurrence and intensity of bushfires and frequency of inundation along the Derwent River.

Keywords: climate adaption, design education, creativity

Introduction

It has become commonplace to suggest that grappling with climate change is an inherently futures-oriented concern that cannot be understood in all of its complexity using conventional approaches to problem solving. The unpredictability and uncertainty associated with human induced climate change has fostered a move beyond predictive, precautionary and reductive approaches towards those that harness creative capacities to adapt. Emerging approaches to learning and teaching aim to provide space for students to actively imagine and anticipate the future: to think the not-yet imagined (Davis and Sumura 2007). Within this context, as Davis and Sumura (2007, p. 53) argue ‘what teaching is can never be reduced to or understood in terms of what the teacher does or intends. Rather, teaching must be understood in terms of its complex contributions to new, as-yet-unimaginable collective possibilities’.

What this suggests is that teaching involves facilitating a process of inquiry that remains open to unknown possibilities rather than pre-determined outcomes. Hence, teacher and students become co-learners in the quest to discover that-which -is not-yet -known.
In this paper we propose that design as a mode of practice that draws on both intuitive and rational knowledge, provides an avenue for capturing complex issues as a whole and conceptualising them within real-life contexts. Complex matters, it is argued, cannot be grasped completely and so an iterative sequence of steps towards large-scale urban landscape design is proposed (Werner 2013) that begins with a phenomenological inquiry on the ‘matters themselves’ (Moran 2000) allowing for an open and empathetic approach to a specific site/condition. To grasp ‘these matters’ as a whole and to tackle complexity in its entirety requires trust in intuition, emotion and empathy as specific and productive human ‘devices’.

Phenomenological inquiry and interpretation inform site analysis simultaneously through which initial design ideas emerge. These initial ideas then structure and drive a “process of understanding as a variable, transformatory procedure pattern for the entire process of space-oriented design” (Seggern & Werner 2008b, p. 207). Phenomenology suggests an approach that endeavors to engage with the ‘matter themselves’, the phenomena, by attempting to bracket prejudgments, however, a hermeneutic understanding considers prejudices as ‘biases of our openness to the world [... that] constitute the initial directedness of our whole ability to experience.’ (Gadamer 1976, p. 9). And elsewhere Gadamer (2013, p. 332) states,

> The person who is understanding does not […] stands apart and unaffected but rather he thinks along with the other from the perspective of a specific bond of belonging, as if he too were affected.

Using a landscape architecture design studio as a case study the paper discusses how a course of action that works between different ways of knowing – intuitive, rational, emotional, embodied, empathic – leads to an approach that can embrace and work with uncertainty and complexity.

**Understanding Glenorchy’s landscape**

Landscape Architecture design studios provide an experiential, task-based learning environment based on real-life issues. “Beyond anticipation. Designing Climate Futures for the City of Glenorchy” offered in semester 2, 2014 had as its overarching theme or framework climate adaptation or confronting and productively working with the uncertainty of climate change in the urban context. It was a graduating studio for ten students from the Bachelor of Design (Landscape Architecture) and Bachelor of Urban and Regional Planning; a multidisciplinary degree offered by the Landscape Architecture program at RMIT University Melbourne. A multidisciplinary teaching team led the studio with backgrounds in landscape architectural design, relational Gestalt psychotherapy, environmental science, urban policy and sustainability.

The site chosen for the studio was the City of Glenorchy in the south of Tasmania, a local government area that covers several northern suburbs of Greater Hobart. The city spans the western bank of the Derwent River, which is its main waterway. Several creeks and rivulets flow from Mount Wellington Park into the Derwent River. The City of Glenorchy is a multicultural area with a population of approximately 45,000. This local government area is the third largest within the Greater Hobart region, which has a population of approx. 212,000. A mix of industrial, commercial and residential development characterizes the city.
Key climate change risks by 2100 for the City of Glenorchy were identified in the Council's climate adaptation plan (2013). These included:

I. The temperature of very hot days to increase by up to 3°C.

II. Extended heat waves and more extreme temperatures are likely to enhance the occurrence and intensity of bushfire.

III. Rainfall trending towards heavier events interspersed by longer dry periods and for greater extremes.

IV. Inundation along the Derwent Estuary frontage to increase. The current 100-year storm tide event (0.9 to 1.4 m above average sea level) may become a 50-year event by 2030, and a 2 to 6-year event by 2090 (City of Glenorchy 2013).

The studio had as its starting point an understanding that anticipating the future requires more than simply constructing an alternative vision of the future or working from the present into the future in a linear way: it requires first and foremost the ability to work with complexity and uncertainty in a way that moves us beyond preemption, preparedness and precaution (Anderson 2010). To do so is to problematize the future in both space and time. As Anderson (2010, p.778) so clearly puts it:

Common to all forms of anticipatory action is a seemingly paradoxical process whereby a future becomes cause and justification for some form of action in the here and now. This raises some questions: how is ‘the future’ being related to, how are futures known and rendered actionable to thereafter be acted upon, and what political and ethical consequences follow from acting in the present on the basis of the future? Addressing these questions requires that we explicitly conceptualize the relation between space-time and futurity.

Students were asked to consider how to move beyond precaution towards an approach that imagined and creatively embraced uncertain futures. Key questions addressed in the studio included: How can communities improvise and adapt to continuous change and uncertainty? How can we move beyond projection – or geographies of anticipation towards an approach to
the future that engages with and harnesses uncertainty and continuous change? The openness of these questions allowed students to explore the not-yet-imaginable and the role of the teacher was to provide a space in which this could occur. As Davis and Sumara (2007, p. 64) suggest,

> Teaching here is more about a conscientious participation in expanding the space of the possible by creating the conditions for the emergence of the not-yet-imaginable, rather than about perpetuating entrenched habits of interpretation (or even exploring the limits of current imagination). Teaching, like learning, is not about convergence onto a pre-established truth, but about divergence – about broadening what can be known and done. In other words, the emphasis is not on what is, but on what might be brought forth. Teaching thus comes to be a participation in a recursively elaborative process of opening up new spaces of possibility while exploring current spaces.

The studio worked with an integrative design approach that does not distinguish between the phases of analysis and idea finding as separate but rather acknowledges them as simultaneous and interwoven acts of a creative design process (Seggern & Werner 2008a). A constructivist approach (Bruner 1990, p. 30) was adopted for the studio whereby the present and the future are understood as open to multiple, diverse and sometimes conflicting interpretations. Consequently, any attempt to define an initial situation, and any consideration and analysis of the existing state of things is necessarily an interpretation and thus an idea.

To maintain this level of openness a phenomenological approach was adopted for initial site investigations so that students could discover the potentials, possibilities and multiplicities of the site on the basis of the actual phenomena of the site in dialogue. One of the central concerns of phenomenology is the possibility of gaining awareness and access to the subjective experiences of others (in this case the residents of Glenorchy) yet there are difficulties inherent in this. Since each person is an experiencing subject, they can relate to experiences of others, though it may be impossible to replicate these exactly. Phenomenology therefore advocates the use of empathy in an attempt to position oneself closer to experiencing others while at the same time heightening awareness of the values underpinning ones own position.

Hence, from the outset the students were asked to set aside as far as possible their preconceptions, prejudgements and prelearnings in order to connect with their individual experiences of Glenorchy’s urban landscape through walking and observing phenomena. They were also asked to look beyond the obvious and set aside familiar approaches in order to develop their own idea of the place. Place here is understood in all of its complexity as deeply embedded in the relationship between the material and the immaterial, the human and the non-human. As Ingold (1993, p. 155) writes,

> …a place in the landscape is not 'cut out' from the whole, either on the plane of ideas or on that of material substance. Rather, each place embodies the whole at a particular nexus within it, and in this respect is different from every other. A place owes its character to the experiences it affords to those who spend time there - to the sights, sounds and indeed smells that constitute its specific ambience. And these, in turn, depend on the kinds of activities in which its inhabitants engage. It is from this relational context of people’s engagement with the world, in the business of dwelling, that each place draws its unique
significance. Thus whereas with space, meanings are attached to the world, with the landscape they are gathered from it.

Phenomenological inquiry and interpretation (Armstrong 2003, Gadamer 2013, Seggern et al. 2008) can be viewed as activities which ‘structure’ a process of understanding and which require as well as stimulate creativity (Seggern & Werner 2008a). One could say that ideas emerge along the threshold from contact with the matters themselves (phenomenological mindset) and interpretations (hermeneutics), which make understanding explicit (Gadamer in Orange 2011, p. 20). This moment of explicitness is what we are looking for in design, a never fully describable and graspable ‘miracle’ (Seggern 2008), which could be described as a fusion of ‘creative touch’, understanding and the transformation of complexity into productive and inventive design ideas.

To facilitate this process the studio started with a 7-day workshop on site. Extensive information exists about the current situation in the City of Glenorchy, and future strategies have been developed, however, in the initial stages of the studio these were deliberately set aside. Students were explicitly encouraged to not search out information about the area prior to the workshop. Instead students’ first immediate encounter with their study area was by walking individually for a whole day. The understanding here was that the landscape does not exist separately from those people who inhabit it, who shape and give meaning to it. Hence, the approach adopted encouraged students initially to move away from maps, documents and proposals towards their own immediate engagement with site. Also, in not attending to external information initially there was an explicit valuing of what each student brought to the issues under consideration. Students often perceive themselves as unknowing and are inclined to overvalue available information rather than trusting their ‘not knowing’. Creativity research though has shown that a state of ‘not knowing’ – felt or real – acts as a productive point of departure (Sawyer 2012; Sternberg 2006).

Following Schultz (2014) walking was chosen as a method to encourage this direct engagement, as

…the simple act of walking stimulates the complex, iterative process of landscape design. It supports and integrates engagement (intensively perceiving space), flow (encouraging intuition), and reflection (supporting organization).

For the initial exercise the City of Glenorchy was divided in 10 equally sized strips each roughly ranging from the elevated topography of Mount Wellington Park at the west site of the study area to the River Derwent concluding the study area eastwardly and crossing settlement areas in between. Each student was randomly assigned one strip. Walking only one part of the whole study area is based on the principle of similarity ‘as in small so in large’ for exploring large-scale urban landscapes in teams (for more detail see Werner 2008; 2013). It also draws on the work of Bruner (1986, p. 93) who has argued that,

…in the main, we do not construct a reality solely on the basis of private encounters with exemplars of natural states. Most of our approaches to the world are mediated through negotiation with others.

Working actively with the relationship between a whole and their parts – both within landscapes and teams – allows an individual firstly to develop a subjective relationship with a particular part of a landscape, as a part of the whole, that then is enriched by exchanging
experiences with the collective, gradually shaping a ‘picture of the whole’ – collectively and individually. The understanding of the landscape and space employed here is multidimensional where:

We describe space as a multidimensional performative process (Geschehen). This definition regards space in terms of more than its physical constituents, as something that encompasses not only its physical and topographic characteristics but also integrates its historical, cultural, aesthetic, economic or social dimensions. For us, people are as much part of this space as those who through their actions, memories and perception create it. Only through the integrative interaction of these many dimensions does the full extent and manifold character of space become apparent (Seggern & Werner 2008a, p. 39)

For the walking exercise the ‘task’ students had to attend to was ‘simply’ to “open up and perceive with all your senses! Be curious about everything and anything”. The assumption is, that in the act of walking perception, creative action, and reflection come together (Schultz 2014), which eventually generates specific and situated knowledge about an area. Walking allows us to become a part of the ongoing performance of a landscape itself, to feel it, to smell it, to hear it, to like or even to fear it. Landscape here is understood as constantly in motion, continuously changing through time. Past, present and future are relational, where,

...the present is not marked off from a past that it has replaced or a future that will, in turn, replace it; it rather gathers the past and future into itself, like refractions in a crystal ball. And just as in the landscape, we can move from place to place without crossing any boundary, since the vista that constitutes the identity of a place changes even as we move, so likewise can we move from one present to another without having to break through any chronological barrier that might be supposed to separate each present from the next in line (Ingold 1993, p. 159)

In order to connect parts with the whole, students were asked to draw a ‘picture of their whole strip’ that then became a part of grouping with their two neighbors to find their next ‘picture of the whole’. In an ongoing negotiation through drawing, representing, changing groups, going on site again, within a couple of days students were able to develop a strong initial sense of the entire area – their ‘picture of the whole’. Understanding and working in different spatial scales is generally part of a landscape architects’ repertoire. This project – as a precedent for large-scale landscape design – extended on this by asking the students to work from the specific to the regional to the global recursively. For instance, the workshop tasks required more than simply aggregation – students were explicitly required to express their spatial and temporal understanding of the regional level of Glenorchy in a ‘portrait’. The concern of not having seen each part of the study area began to diminish over a sense of ‘having an idea’ of the whole through the building up of a collective understanding.
By the end of the workshop students had developed what was termed a ‘portrait’ of Glenorchy based on their own explorations and experiences, underpinned with information they had gathered over the workshop week from stakeholders and residents they had encountered through walking and from each other. The workshop closed with a presentation from the students to members of Glenorchy City council and a landscape architecture practice. In teams students presented their ‘portraits of Glenorchy’ that simultaneously contained both their initial ideas of Glenorchy and initial design ideas for Glenorchy. According to the understanding that ‘ideas represent ‘aids of disentanglement’ in design […] and] provide decisive ‘navigation’ […] within a complex ‘tangled mass’ of problems’ (Werner 2008, p. 301) on the basis of their (initial) ideas students now were much more able to ask questions to the panel, engage productively with available information and get in contact with experts, locally and beyond.

The workshop was followed with weekly classes, over a 10-week period, where each student further refined their core idea that would drive their design projects. At mid semester another trip to Glenorchy was conducted, where they presented their mid semester work to a similar panel as at the workshop. Presenting in Glenorchy allowed students to go on site again with a stronger lens for particular questions/issues; allowing them to engage in dialogue with local community representatives rather than simply accept what had already been thought of before.

**Beyond Anticipation: Designing Climate Futures for the City of Glenorchy**

Extracts from two student projects may help to demonstrate how students were able to engage with and work with uncertainty and complexity.

Figure 3: Top: Existing relationship between moisture, fire and vegetation; bottom: Proposed relationship between moisture, fire and vegetation
The project “Toned. Adjusting the relationship between fire and moisture with vegetation in Glenorchy’s forests through design” by Kaitlyn Zeeck approached the question about increasing bushfire hazard by asking what the forests would need to be healthy and not to burn so quickly in the event of bushfire. That led to an understanding of the relationship between vegetation, soil, water, topography and fire to develop treatments for the entire ecosystems to adapt to climate change instead of focusing on infrastructure (fire breaks, fire walls, evacuation planes etc.) to protect the existing forest. Understanding that various forest types respond differently to fire, it became apparent that wet forests retain moisture and have a lower frequency of fire, whilst dry forest encourage fire but are susceptible to increased erosion and therefore loss of nutrients.

![Figure 4: Fire effects on Glenorchy's forest. Left: Effect of fire in dry forest; 2nd from left: Soil sterilization; 3rd from left: “Ash bed” effect; right: Erosion and runoff](image)

As a consequence of climate change it is predicted that fires will occur more frequently and result in a lack of healthy vegetation. To address these vulnerabilities the proposed strategy for Glenorchy’s forests is to shape erosion on the northern slopes following a fire. This treatment would use raised berms and rails to reduce the extent of erosion to gradually sculpt the topography encouraging ash, seeds and nutrients to settle and germinate instead of being washed away from the site. This will allow fire vulnerable dry forests to regain their strength. And as a ‘side effect’ these berms were designed for mountain bikes to enjoy the forest without impacting on the delicate eco system.

![Figure 4: Soil traps serve both ecological (primary) and social (secondary) functions. The soil traps have been designed on 35 degree angle to accommodate bike riders as a temporary user.](image)

Another project dealt with water. “reFRAmed EDGE” by Emma Mydaras fortified, retreated or adapted Glenorchy’s coastline to climatic impacts by identifying the existing coastal conditions and the impact a rising sea level will currently have on them. The question was how these conditions could be either strengthened or alternative outcomes adopted to reframe this edge with the intent to strengthen its defensive characteristics. After carefully observing the existing ways of how water and land interact in Glenorchy three key strategies were discovered and developed – fortify (providing defensive works to protect against inundation), retreat (withdrawing settlement/ infrastructure away from the edge to allow the water to
inundate) and adapt (to accept and adapt to the new conditions created by sea level rise through modifying and designing a new edge condition). While there is a realisation that focusing on protecting infrastructure against sea level rise is too short-sighted this project focuses on climate change as an opportunity to identify whether land needs to be fortified, development needs to retreat from this edge or land and water can adapt and work together.

Figure 5: Images left: Design Principles fortify (top), retreat (middle) and adapt (bottom) (in exaggerated form); Image right: Different relationships of the three principles to the built landscape: In the fortify zones, development is located right up to the edge, in the retreat zones, development sits away from the edge and in the adapt zones, development is not evident.

Figure 6: All sections show a side classified as ADAPT – 1st section: Existing conditions; 2nd section: Predicted sea level rise 2100 (With the predicted 1m rise in sea level, half the existing park will be lost. During high tide, the whole park will be unusable and in the case of a storm surge, the road will be unusable.); 3rd section: Strengthening ADAPT by applying ADAPT to an ADAPT site; 4th section: Applying RETREAT to an ADAPT site which in turn enhances ADAPT.
Both projects were able to derive their ideas “out of the landscape itself”. Through the development of a situated understanding of specific site conditions both projects reflect an understanding of a complex socio-ecological present while suggesting possible future interventions that allow for adaptation to the uncertainties of climate change. The accomplishment lies in unfolding these future interventions out of an ‘open-minded dialogue’ with the landscape itself bearing in mind that besides common features we use to describe landscapes each landscape is complex, distinct and unique. Gadamer built his dialogical hermeneutics on the model of conversation between two people. What understanding a person or a matter have in common is… ‘that both are concerned with a subject matter that is placed before them.’ (Gadamer 2013, S. 386) and that ‘understandings are not conveyed from one mind into another but emerge from conversation’. (Orange 2011, p. 25). It was the facilitation of such an open, yet empathic dialogue with Glenorchy’s landscape itself that allowed the students to encounter hidden potentials and work with these to address the uncertainties of climate change.

A number of rivulets cross Glenorchy’s landscape, running down from the mountain into the River Derwent. Reflecting previous attempts to gain control over waterways and regulating water flow these rivulets are almost indistinguishable on a map as many sections are piped underground or fenced off placing them outside of public perception. Nonetheless the majority of student projects identified and then focussed on the redevelopment of the rivulets. This was clearly due to the phenomenological site enquiry that encouraged students to take into account what they saw and experienced rather then what they studied in maps or reports. Descriptions or naming of the rivulets in a strategy document would not have allowed the students to experience how significant these rivulets are in the Glenorchy landscape. But on the day when the group walked the site there was particularly heavy rainfall, which allowed the students to ‘follow’ the water through the landscape, from the mountain to the coast. It also allowed them to see at first hand that due to over engineering of the rivulets their capacity for capturing and directing the flow of water has been reduced. A one day rain event already seemed to push them to their limits – students asked - how would that look like under changing climate conditions? The comprehensive understanding of the landscape as a complex system has made students realise that under climate change these rivulets will become important in any response to the increasing forces of water and fire.

**Conclusion**

Uncertainty requires openness, a willingness to experiment and to be process-oriented instead of outcome-focused. In the studio outlined here this found expression in an approach to teaching and learning that opened up spaces for students to explore the not-yet-imagined. An approach to site analysis where phenomenological inquires proceeds simultaneously with interpretation provided a space for students to explore climate futures for the City of Glenorchy. Rather than proceed from that which is already known students were initially asked to maintain a level of openness to site through walking. The approach allowed them to become a part of the ongoing performance of a landscape itself revealing hidden potentials and opportunities to propose novel responses to what was and is clearly a complex and challenging set of circumstances.

The paper demonstrates the value of design in tackling and working with complexity and uncertainty. The design research strategy detailed focussed on embracing spatial complexity, grasping a “picture of the whole” through an interpretation of the current situation and holding the complexity of large-scale urban landscapes in site-specific design projects. The
paper also demonstrated how a course of action that works between different ways of knowing – intuitive, rational, emotional, embodied, empathic – can lead to an approach that actively embraces and works with uncertainty and complexity.

Acknowledgements

We would like to acknowledge Tony McMullen Manager, City Strategy, Glenorchy City Council and Jerry de Gryse from Inspiring Places, Hobart for their assistance, feedback and support. The work is informed by STUDIO URBANE LANDSCHAFTEN, a network for design teaching, research and practice based in Germany (www.studiourbanelandschaften.de).

References

Werner, J. (2013). Knowing (by) Sensing. Reflecting on the importance of emotion and intuition in large-scale urban landscape design. In J. Verbeke (Ed.), Knowing (by) Designing. Brussels: St Luca