



MAKING CHANGE

Explorations into enacting a disruptive pro-sustainability design practice

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Abstract

Making Change explores tactics for effecting pro-sustainability change in and through a transdisciplinary approach to design. A variety of designed interventions within existing education and communication systems were undertaken. Employing the reflective practice of action research and other design methods, experimental and intentionally disruptive projects were developed to generate tactical ways of operating within particular cultural conditions. These projects take the form of educational tools, interactive installations, performative presentations and games. Each one explores the use of challenging, storytelling and playing, to reframe, communicate and incite uptake of embedded sustainability interests in education, design and social practices. This research has revealed tactical ways of enacting a disruptive design practice to generate pro-sustainability cultural and social influence.

Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

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1. THE INTRODUCTION

1.1 OVERVIEW

This research presents an exploration into ways of enacting an agenda to effect pro-sustainability change through a design practice by experimenting with practical modes of operating that enact positive social change. This has been conducted via the development of project-based 'disruptive interventions' into education and communication systems. Thus, a range of Design Projects were developed, enacted and reflected upon in order to generate tactical ways of operating through a creative practice, with the explicit aim of increasing the awareness and adoption of socially and environmentally beneficial outcomes in the design of products, systems and services. As a result of the project-based explorations, tactical ways of operating within a Disruptive Design Practice were developed, and are proposed herein.

A series of Projects exploring the opportunity for designed interventions, were utilised as case studies through which methods were developed for enacting a Disruptive Design Practice (this is detailed in Section 5.3). The Projects explored opportunities for provoking shifts within existing educational and communication systems, to facilitate change-making incursions that propose sustainability as an opportunity for engagement. These Projects were enacted through a variety of mediums, and sought to test and experiment with divergent ways of practicing that combined the disciplines of design, sociology and environmental science, forging a transdisciplinary practice focused on effecting positive social change.

The experimental Projects developed for and discussed within this body of work include animations, analog games, smart device applications (apps), interactive installations, educational propositions, books and high profile performative presentations. These Projects, detailed in Chapter 4, served as the vehicles through which experience based explorations enabled the development of the proposition for a Disruptive Design Practice. Namely the process of intervening into a system through the identification of the arenas in which one can leverage change, and within this, forming tactical ways of operating. Whilst drawing on many existing design practice methods, the developed Disruptive Design Process focuses heavily on a systems interventionist approach to design development. This approach enables a practitioner to apply tactical modes of operating within an identified system by moving through an opportunity analysis, problem mining, research, ideation,

rapid prototyping, iteration, development, implementation and reflection, whilst always drawing on the system dynamics within which the intervention is seeking to leverage change.

This exegesis outlines a journey—a framed set of experiences explored through the lens of effecting pro-sustainability change. It documents a finite period of time within which certain questions were explored, and the outcomes are presented here as provocations. The journey of progression through a practice based PhD is inherently personal and productive. The personal explorations and reflections arise from the produced works and the embodied experiences that emerge, are evidenced through the practice process that one incorporates into the understanding and justification of one's work. The claims made herein are born of, and evidenced by, an intimate relationship between theory and practice, creating a tapestry of experience that has influenced and generated new ways of thinking, knowing and doing. This has been distilled through the active change-making processes employed and is discussed through the propositional framework of enacting a Disruptive Design Practice.

1.2 EXEGESIS STRUCTURE

This exegesis is presented in six Chapters. Chapter 1 provides an introduction and framing of the research for which this PhD was conducted. Chapter 2 defines the personal and theoretical context within which this practice has evolved, and the means by which it has been explored. This chapter also includes the practice work conducted prior to the PhD, and proposes a Theory of Change in which this body of work is grounded. In Chapter 3, The Process is discussed, exploring the foundations and relationships between The Projects and the sociological theory relevant to this body of work. Chapter 4 details specific Projects that were developed, and experimented with, through The Practice explorations which are outlined in Chapter 5. The Practice chapter also offers the contribution to new knowledge, evidenced through a discussion of the tactical ways of operating, and the development of a Disruptive Design Process. Finally in Chapter 6, conclusions are presented; examining how the research question has been addressed and summarising the future direction of this work and practice.

1.3 RESEARCH AIM, OBJECTIVE AND PURPOSE

This presented work provides an account of a particular type of change-making praxis, exploring the development, contextualisation and articulation of tactical ways of operating when motivated by an agenda to actively participate in the reinterpretation of dominant constructs of social and environmental change. To this end, the research has experimented with a range of disruptive tactics and methods in seeking to enact pro-sustainability change through design. Christensen's (2000)

theory of 'disruptive innovation' positions an approach of divergent interventions into a market in such a way as to dramatically alter or shift the dominant market practise. This research argues that given the current framing of disruption, it is not what is being embodied through this work. Instead, there is a need for the re-framing of disruption to include 'disruptive interventions' that seek to leverage and effect shifts in systems for pro-sustainability change. This activates disruption within a systems approach to design practice.

The primary aim of this research has been to explore modes of actively participating in the construction of a more equitable and sustainable world. This has been enacted through the development of a transdisciplinary practice that combines design, sociology and environmental sciences to form a new type of intentionally disruptive creative production. To achieve this, the present research has explored through an array of experimental propositions into educational content, and wider public communication approaches, embracing the position that design is a major influencer of social norms, and thus, change can be challenged through the use of designed interventions into everyday systems.

As discussed by de Certeau (1984), 'tactics' are ways in which people reappropriate elements of mass culture to make them their own, specifically, through subverting the rituals and representations that dominant power structures impose upon them through strategies; these being devised plans and institutional processes that put in place structural norms and social conventions. Tactical ways of operating allow for a creative resistance, these 'arts of doing' are by their very nature defensive, disruptive and opportunistic acts seeking to seize power in momentary ways (Blauvelt, 2003). In developing tactical ways, one 'makes do' with the assemblage of resources available to them in constructing a practice of resistance.

To this end, as an actionist¹ with an impassioned approach to empowering my own practice through adopting the role of 'sustainability provocateur', these motivators have been employed. Allowing explorations into how a designer/sociologist can make change, in and through their own practice. This has evolved into a series of tactical ways of operating through a Disruptive Design Practice. In exploring opportunities for alternative approaches to framing discourse (Lakoff, 2008), this exegesis will argue for a re-framing of the symbolic and practical use of the terms 'sustainability' and 'disruptive'. Through the developed Projects, I have experimented with the use of positive

¹ Brown and Humphreys (2003) discuss how change is ever constant and elusive, this construct has influenced the adoption of an actionist approach to designing change interventions (Coughlin & Khinduka, 1975; Kemmis & McTaggart, 2005; Schou, 2007).

framing, subversive messaging, appropriated adhocism (Jencks & Silver, 2013) and activation framing in the formation of divergent approaches to communication and educational experiences.

The argument put forward herein, proposes that when sustainability (and its subsets of climate change, resource conservation, waste issues, consumption, social inequity etc.) is negatively framed through devices such as fear, the resultant outcomes are largely ineffective as mechanisms for creating transformative change, neither does it allow people to identify and integrate sustainability as a core component of their perspectives and practices (O'Neill & Nicholson-Cole, 2009). The language of alarmism, often used in communicating critical social and environmental issues, has led to disengagement, avoidance and resistance to change², and thus breeds a space for designing activated interventions that frame sustainability as an opportunity for engagement. Thus, the framing that this practice takes on through the development of project-based interventions is that of play, fun, opportunity and inspiration.

To this end, disruption and subversive agitation are critical components to the modes of operating in this body of work. The tone, structure and pre-defined ways of doing, generate uncertainty and complexity that feed into many of the so called 'wicked problems' (Rittel & Webber, 1973) that are collectively faced by contemporary societies. The need for constant flexibility, dynamic agility (Li, Gao, Yan, & Liu, 2008), criticality of oneself and one's world, is of foundational relevance to the way in which this work is approached. As Einstein said, a problem can't be solved with the same thinking that created it (Pourdehnad, Wilson, & Wexler, 2011), and furthermore, Peter Senge (2006) aptly describes today's problems as being yesterday's solutions. It is therefore proposed that we must now take a contemporary approach to designing agenda-driven pro-sustainability solutions that seek out opportunities for disruptive interventions that in small and subtle ways (Manzini & Rizzo, 2011), critique, shift and challenge the status quo for positive social change.

1.4 RESEARCH QUESTION

The research question explored throughout this PhD is:

How can pro-sustainability change be enacted through a disruptive design practice?

² Several recent studies (Mulvaney, 2010; M. Nisbet, 2010; O'Neill & Nicholson-Cole, 2009; Rutter, Abraham, & Kok, 2001) have found that the use of fear and moral panics as the engagement mechanisms for communicating environmental action were found to be ineffective, along with other studies that address the ineffective use of fear as an engagement mechanism in social marketing (Hastings, Stead, & Webb, 2004). Further to this, Hulme (2008) unpacks the cultural conditioning and historical significance of the use of fear in framing climate change.

This research question evolved throughout the practice based research process, initially seeking to address the ways in which sustainability can be communicated as an integral rather than an 'add-on' component to design activities. Through this PhD, the question expanded into a meta-level inquiry into how a design practitioner can enact an agenda to effect positive social change both in and through their practice, specifically exploring the development of tools and methods that enable a divergent redirected approach to practicing. This re-framing of the conceptual approach within this body of work raised a series of sub-questions that played out through the explorations:

- How can I be an active participant in positive change-making?
- How can I merge the design, sociological and environmental science arenas of my practice to form a new approach that activates my agenda to effect positive social change?
- What tools and processes can I develop that enable a transfer of such practice approaches to other agenda-driven designers seeking to make positive social change?

These questions are personal and professional in nature, having affected the way in which this practice has evolved, and consequently the type of work produced. These questions have synthesised into the meta agenda of this body of work, to seek out divergent ways of practicing design for sustainability, and at a macro level, to participate in the change that I want to see in the world. This frames a 'leading with agenda' approach to practice that has greatly influenced the production of this body of work.

1.5 GAP AND SIGNIFICANCE

This work contributes to the fields of sustainable design, education and communication for social and pro-sustainability change. The forthcoming discussion in section 2.6 concerning issues in the uptake of sustainability considerations in design, demonstrates a gap in the ways that social and environmental concerns are currently packaged, presented and framed to designers and the wider community of 'consumers'. Thus, the gap in existing knowledge to which this PhD seeks to contribute, is the positive re-framing and application of approaches to communicating and educating about sustainability as an opportunity for design practice and positive social influence. Additionally, a provocational offering of tactical ways of practicing through a Disruptive Design Practice are presented as part of a new type of socially motivated design praxis.

Building on the arguments put forth by Papanek (1985), Whiteley (1993), Nieuwma (2004) and Manzini (2009) for socially and environmentally concerned design, active experimentation across divergent avenues of re-framing and communicating design toward sustainability, to specific segments of the design community—particularly the education sector—has been carried out. A

more general participation in social discourse, such as through performative presentations and game based applications, have also been implemented during the course of this research.

The value of The Projects presented herein lies in their ability to explore divergent ways of communicating sustainability in design, production and consumption, and the application of these methods to educate, inform, and engage both designers and the wider public in social practice change. Of primary significance are the tactical ways of operating enacted within a Disruptive Design Practice and through the methods developed as a result of these explorations.

It is important to clarify that this exegesis is an exploration of practice approaches relevant to enacting an agenda of pro-sustainability change, and is not an analysis of the change outcomes associated with such practice approaches. A limited discussion of the empirical and experiential change potential is provided, but this is not the core lens with which the PhD research was approached. Quantifying change is important yet difficult to carry out given the longitudinal and dynamic nature of change (See Section 1.8 for the Theory of Change underlying this work). Thus, this exegesis should be read from the perspective of an agenda-driven, creative practitioners' experimentation with modes of embodying, participating, agitating and evoking change in and through creative and analytical practice. From this perspective, the significance of this work is embedded within the proposition of tactical ways of enacting change and the framing of a Disruptive Design Practice, based on systems interventions.

1.6 METHODOLOGY

This research has employed an action research methodology, one that encompasses the implementation of *action* into research, seeking to bridge gaps between social action and social theory (Peters & Robinson, 1984). Action research upholds the notion that knowledge can be generated through experience, and that experiential learning legitimises the knowledge that influences and effects practice (Kolb, 1984). In order to "(...) understand and improve the world by changing it" (Baum, MacDougall, & Smith, 2006, p. 854), it draws on a range of conventional research methods as well as allowing a practitioner to develop their own approach to research design, data collection, interpretation and dissemination.

Herein, inquiry through action is approached through the 'action research cycle'³ whereby one improves their practice by "(...) systematically oscillating between taking action in the field of

³ Originally coined by Kurt Lewin in 1944 'reflective action research' employs the action research cycle of planning, acting, observing and reflecting (Altrichter, Kemmis, McTaggart, & Zuber-Skerritt, 2002).

practice, and inquiring into it”, allowing the practitioner to plan, implement, and evaluate an always improving shift in one’s practice methods (Tripp, 2005, p. 443). As a form of practice intervention through dynamic response to experiences gained in action, taking this approach to research through reflective action (Lewin, 1944, 1946; McIntyre, 2008; Schön, 1983) has allowed for an embedded experimental exploration of the research questions.

Dewey (2007), Schön (1983) and Freire (2000) all propose that contributions to personal and professional practice are enlightened through a reflection-action process. Reflection is a ‘state of mind’ that challenges assumptions and ideological positions; it pushes personal and social boundaries and seeks to overcome biases and inequalities (Bolton, 2010, p. 2010). It is argued that prior experience contributes to the epistemological approaches employed by the researcher. Building on initial studies in design, sociology and environmental sciences, this research has drawn heavily on the researcher’s sociological training in conducting this research. Qualitative interviews (both formal and informal), ethnographic research and theoretical analysis were employed in this body of work, whilst also developing new methods of inquiry as discussed in the following section. Just as Fiske (1992) argues for the use of “(...) personal experiences of living and practicing culture as a key element in the production of theoretical discourse and its more distanced and generalised explanations of the world” (p. 159), the research has taken an experiential approach to the development of this body of work.

1.7 METHODS

Various methods are used to record the outcomes of action research, including the use of a research diary or a written log (Hughes, 1996; McKernan, 2013). Alternatively, as with this work, an experimentation using a variety of appropriately reflective record keeping methods were incorporated. The use of *critical word dissections*, game-based explorations, and *reflective talking* were all developed and integrated. *Reflective talking* was employed extensively throughout the research process drawing on an audible learning process (Fleming & Mills, 2001; Vincent & Ross, 2001), whereby the act of recounting something aloud allows for conceptualisation and processing of information present in the mind. Employing this method allowed for subconscious insights to be uncovered and the saliency of thoughts to be distilled for further analysis and incorporated into new experimental project propositions.

Reflective talking invokes a space that allows for mutual investigation and unexpected provocations. It incorporates the playfulness of chatter—like a tennis ball being rallied across a court, the randomness of where it will land and the agile movements of the opponents to rally the ball back, allows conversations to explore, distil and generate ideas with unexpected outcomes. I refer to this

as the 'bounce', when ideas are bounced back and forth between two or more people, allowing for the evolution and transformation of an idea into an action. This process requires the willing participation of others, and although techniques can be established for individual *reflective talking*, the benefits of bouncing ideas off others was uncovered through the development of this method of critical reflection in action. The development of a praxis of critical thinking has led to action outcomes being identified and harnessed throughout the research process (Moon, 1999).

The Projects discussed in Chapter 4 have involved a range of collaborations with other practitioners, allowing *reflective talking* to evolve new approaches to Project development and creative outputs. This approach is similar in concept to Narrative Therapy⁴ whereby talking is used to externalise experience. The narratives developed through *reflective talking* allow for the development of rapid idea prototyping; utilising the bounce method, ideas are generated from experiments and externalised through narratives that feed into the development of new ideas, which are then tested, reflected upon, adapted and evolved⁵.

Another complementary reflective method developed to assist with analysis has been *critical word dissections* conducted through a variety of activities, such as applying individual practice words to coloured Lego bricks, which were then used to construct thematic representations of ways of doing through individual units that could be relocated and prioritised in diverse modes. This method of deconstructing and defining 'chunks' of transferable information became a critical part of the Projects developed in this practice. In facilitating further personal reflection, a narrative based inquiry card game was developed to employ both the *reflective talking* and *critical word dissection* methods (these are explained in section 5.5). The experience of utilising such methods evolved into the development of The Projects: the *Design Play Cards* and the *Game Changer Game* as well as refining certain approaches to reflection on and in practice.

⁴ Narrative therapy developed by M White and Epston (1990) proposes constructionist approaches to understanding one's experiences through narratives, and thus reflect and grow from the understandings gained. Critically, the process allows for an externalisation of experience thus enabling a process of reflection to occur.

⁵ Explorations of these methods in practice are provided in more detail in The Projects in Chapter 4.

2. THE CONTEXT

2.1 CHAPTER 2 - INTRODUCTION

In this chapter, an exploration of previous modes of operation that have influenced the development of this PhD research are provided. The research context and arena is set, through the theoretical perspectives from which the research has been undertaken. The Theory of Change relevant to this body of work is outlined and a brief discussion of the historical position of the term 'sustainability' is provided. Also, the development of the field of 'design for sustainability' is included due to its implication in the positioning of this PhD research project. Finally, a discussion of the frame of 'design interventionist', and 'tactical ways' is unpacked along with a community of practitioners relative to the context that is being claimed.

2.2 PERSONAL AND SOCIAL BACKGROUND

As this PhD has been conducted through reflective action research, continual reflection in and on motivations and experiences has been performed throughout the research process. It is necessary therefore to include a certain level of personal narrative regarding the process through which this work has been established. The tacit knowledge that one brings to creative practice allows for the development of the 'I' (the assemblage of past experiences pertaining to one's field of inquiry), which is in turn relevant to the transfer of knowledge embodied within the events and interactions with which this design practice operates. Certainly, this work is a product of experiences, and critical to its formation is the desire to curate change experiences in others.

The experiences I have had with design, social science and sustainability sciences have created and affected the way in which I view and act in the world, consequently influencing the motivation and development of this change-making design practice.

While studying design⁶, I was introduced to the Gaia Theory (Lovelock, 2000) which demonstrates how everything in nature is interconnected. Upon discovering this, I felt the weight of responsibility of being a designer. I realised that I would be making choices that affected the wider world and,

⁶ After finishing high school I started vocational training in product design and development with the intent of completing a degree in that field of study, however I left after obtaining a Diploma of Design to undertake a Bachelor in Social Science (Environment) at RMIT University with the intent of merging the two fields to work in eco-design.

that it would be likely that I would never know what kind of potential negative or positive impact my decisions would have. Subsequently, I started to become very aware of how my actions as a designer (and as an agent in the world) could and would have negative ramifications. This created a personal challenge. My desire to be a designer was to participate in the solving of problems, not to create more of them. Thus, I left design school and embarked on a degree in social science majoring in sustainability. Through my research, I started to discover that many of my pre-conceived ideas about nature and ‘protecting the environment’ were misguided. This knowledge came through an unpacking of the full life cycle of the material world, helping to build insight into the hidden ‘lives’ that designed everyday-objects embody both before and after we encounter them. This new life-cycle based knowledge greatly impacted my worldview and played a seminal role in forming the ways in which my creative and professional practice is undertaken.

Upon graduating from my Social Science degree, I worked as a researcher into life cycle assessment (LCA) and eco-design for three years at the Centre for Design at RMIT University. After which I embarked on a self-directed study tour of Europe visiting institutions I had admired for incorporating sustainability into design⁷. I was disappointed to discover that there were noticeable differences between rhetoric and action and that many of these powerhouses of eco-design had made limited applied/practical progress outside of their academic interventions. Combined, these experiences led me to what I saw as the pinnacle problem point at the time: that being, the modes of communication to which eco-design and sustainability, more generally, had been subject.

Thus, I embarked on a practice of seeking to effect change in the ways in which design and sustainability were framed and communicated, I did so from a pragmatic perspective, setting my own brief and exploring the possibilities of my agency—*what designer-like approaches can I employ in the framing and dissemination of this information? How can I make it appealing and relevant? What parts of my sociological training and experiences in environmental sciences can I bring to this approach of communicating change?* I began to experiment with adapting existing forms of communication and new media as platforms for agitating change within the educational systems and institutions that were taking a ‘business as usual’ approach. I looked for inspiration in existing case studies and developed projects based on the interviews that I was conducting at the time. The experiences generated during my European tour consequently resulted in the development of the *Secret Life of Things* project. These experiential encounters left me with the impression that there was much good work being done by many passionate and skilled individuals, however, the wider conversation about the role and possibility of design as a social influencer was lagging. I saw this as an opportunity

⁷ On this three-month study tour in 2009 I worked at and with the Eco Design Centre Wales, Polytechnic University in Milan, TU Delft in the Netherlands, and Pre Consultants in the Netherlands.

for intervention and set about exploring how I could leverage what small power I had to actively participate in making change in the area of design for sustainability methods and communication.

Looking back on this time, I would define my initial explorations into change-based communications and educative experiences as proactive; they were a reaction to a set of perceived problems that generated a level of personal discomfort to which I felt compelled to contribute answers. This is not to say that the approaches tested were all 'successful' in the traditional sense, rather the practice of doing, of experimenting and exploring enabled the early formations of a change-led practice.

As my work started to evolve, so did my ideation, experimentation and adaptation of existing forms of cultural currency into propositions and devices for enacting change within this creative practice. I began to experiment with different mediums, designing games, apps, installations and presentations, all of which were formed as experimental interventions into the systems within which I was operating. This coincided with a deeper exploration of systems thinking and the role of the 'active agent' within dynamic systems.

This mixture of experiences and experimental work started to feed into the development of a series of 'tactical ways' of operating, performed through a burgeoning 'Disruptive Design Practice'. The action-research process employed throughout this PhD, allowed for a richer mining of these experiences-in-practice and the resulting distillation of—and intimate experience with—these approaches. Certainly they were not fully articulated in this way prior to embarking on this investigation of practice and the research question.

Additionally, the process of reflective discovery employed herein has been empowering for my creative practice. In transitioning through liminal states of exploration and learning, levels of discomfort were generated and experienced, and as discussed by Pollner, reflective explorations can at times be incredibly frustrating (Pollner, 1991), yet I found these points of frustration to be seminal in the rapid development of new ideas and formative in the crafting of an adaptive way of practicing. This facilitated the development of, a process of incorporating reflection-in-action as a dynamic part of my creative practice; this then formed the proposition of a Disruptive Design Process. As a result, I have come to understand that my tacit knowledge—and my professional capabilities, have been distilled through mining, unpacking and seeking clarity into the hows, whys, and wherefores of what I do. Through this process, I have found this to be true: that "Often we cannot say what it is that we know... Our knowing is typically tacit, implicit in our patterns of action and in our feel for the stuff with which we are dealing"(Schön, 1983, p. 49).

2.3 THEORETICAL PERSPECTIVES AND LITERATURE REVIEW

The epistemological foundations of this work are based in constructionist theory (Berger & Luckmann, 1992; Crotty, 1998; Giddens, 1984; Lock & Strong, 2010), that being: an adherence to the notion that society is entirely constructed by the agents that exist within it and that humans are socially formed through the structures and constructs set about to control and 'manage' society. Yet humans are also the active agents participating in the generation of social structures and conditions that form social conventions and practices. From this epistemological perspective, social practices are seen as being normalised through agents (both in the institutional and human forms) such as discussed in Giddens' (1984) Theory of Structuration.

In a dissection of Giddens work by Turner (1986), society is actively produced and reproduced by its agents employing the use of 'rules and resources'. Rules are the methodologies and general procedures possessed by reflexive agents to create 'stocks of knowledge'. These are then evoked in daily routines, conversations and interactions with other agents. Resources are the 'material equipment' and 'organisational capacities' used by agents to get things done and to leverage power (which is a result of capitalising resources). These rules and resources are 'transformational' in nature, they can be changed, created and recombined – therefore they are socially constructed elements generated by human agents.

Internalised social structures play a significant role in our experience of the world as Bourdieu's concept of the habitus posits. Through this 'society of habit', the dispositions and habits one acquires allows one to successfully navigate social situations. Habitus is acquired through social interactions, processes of imitation, role-play, repetition and game play (Swartz, 2002). These replications of practices are given a particular style and characteristic, from the risk-taker to the timid conformer. One can develop a social-scientific habitus to foster a critically reflective examination of the power structures of the everyday (Bourdieu, 1991). From these theories, one can infer that internal and external social structures shape the ways in which one views and operates in the world. Practices are driven from, and reinforced by, the power structures one legitimises, intentionally or unintentionally. Relevant to this practice is Bourdieu's position on actors acting strategically and practically rather than conforming to external rules – they are strategic improvisers who act based on previous experiences and current constraints.

This is true of this practice. Here I am seeking to 'poach power' from the 'strategists' as part of a tactical approach to enacting a change-led agenda. The tactical ways employed are often subversive, yet intentional in their design and ways in which they are embedded within the Projects forming 'disruptive interventions'. One could argue this is about power, who possesses it, who

attempts to leverage it, and the ways in which it is used to coerce. Whilst power for Bourdieu is legitimised through the interplay of structure and agency, Foucault determines power to be 'ubiquitous' and beyond any agency or structure. Foucault's power is not a negative force. He calls for a ceasing of its description in negative terms: "...it 'excludes', it 'represses', it 'censors', it 'abstracts', it 'masks', it 'conceals'" instead he calls for it to be acknowledged as a producer, "In fact power produces; it produces reality; it produces domains of objects and rituals of truth. The individual and the knowledge that may be gain him belong to this production" (Foucault, 1977, p. 194) .

The production of power is indeed critical to this practice; power is poached, disrupted, adopted, used and diverted through The Projects produced, and within the embodied position that one takes on as practitioner. This is why the use of media is critical to the effectiveness of the Project based interventions, as the media for all its ills, breeds and reproduces power, and it allows for an amplification that would otherwise be unattainable by an individual acting alone.

Foucault and Bourdieu's differing opinions of how power plays out in society sets up a dichotomy on how one can poach from, and manoeuvre through, the power structures that enforce dominant ways of living in the everyday. I perceive power from both Bourdieu's and Foucault's perspectives: as on one level, power is a commodity that is battled for, traded and transferred in the fields or arenas within which one operates, whilst on the other hand it is an internalised force that we obediently enact, yet find ways to subvert. To this end, power is seen as a resource as well as a driving force that this practice seeks to use and appropriate in whatever ways one has access to. The Projects are incarnations of this; they are creatively produced 'disruptive interventions' into existing systems where power is at play: educational, institutional and social. These systems are explored, mapped and tapped for opportunities of poaching power in divergent and often small ways.

This is all enacted through a systems worldview. Many of the approaches to systems intervention experimented with herein, have been drawn from the works of prominent systems thinkers in particular, Russell Ackoff (1973); Draper Kauffman (1980); Peter Senge (2006) and Donella Meadows (2008). Systems Thinking utilises expanded rather than reductionist thinking, allowing for an intimate understanding of the operational process of dynamic and interconnected systems. Flood (2010) provides an apt description: "the belief that the world is systemic, meaning that phenomena are understood to be an emergent property of an interrelated whole" (p. 269). There is a difference between 'systems' and 'systemic' thinking. The latter supposes that "(...) the social construction of the world is systemic" whereas a systems worldview "(...) advocates thinking about real social systems that it assumes exist in the world" (Flood, 2010, p. 269).

One's worldview forms an individual's perspectives and opinions of the world (Pourdehnad et al., 2011). I envision the world as a series of interconnected systems consisting of three main system structures; The Human System (the social systems that are constructed by human society to serve humanity), The Industrial System (which facilitates the design and dissemination of the products of industrialisation throughout the economy), and The Eco-System (the service and life provider that allows all other systems to exist). These three systems form the foundation, for my understanding of how to intervene and leverage change within a systems framework. Each of these three major systems contain many subsystems that allow one to identify and map the landscape within which one is seeking to effect change. For example, the education system is a sub-set of the human system. In seeking to intervene in a small part of the education system (that being the way in which sustainability is communicated), one identifies potential opportunities for intervention within the system landscape, and then designs a Project. Such is the case with the Educational Projects, which resulted in a series of interventions designed to empower shifts within the discourse around sustainability and design through the use of interventionist/experiential educational experiences.

In adopting a systems worldview, one looks for interrelationships within and between systems. Knowledge and meaning are understood through the building up of 'whole pictures' of social phenomena rather than breaking things down into parts (Flood, 2010, p. 270). It is the opposite of a mechanistic worldview and seeks to overcome the reductionist perspectives of modernity and industrialisation (Kauffman, 1980). Taking a systems perspective also contributes to my epistemological Theory of Change (see section 2.3). As systems can be subverted, shifted, altered and disrupted—these disruptive interventions allow for system transformations (Flood 2010).

It is through experience that one gains intrinsic knowledge (Kolb, Boyatzis, & Mainemelis, 2001). Through this lens, participatory, flexible and adaptive approaches to communication and knowledge transfer have been explored, drawing on Kolb's (1984) work into experiential learning; how the practice of everyday life is experienced by the individual as they move through time and space. This is interpreted and experienced personally through the 'I', in reflecting on the 'us' and the 'we'. Whilst I experience *my world*, there is a common-sense knowledge that is shared collectively (Berger & Luckmann, 1992). This socially generated sense of everyday life is where norms are cemented, power structures are enforced, and change is possible⁸.

⁸ Further to this, multi divergent approaches to educational experiences and communication theories have been explored and are discussed throughout this exegesis (Cassidy, 2004; Day & Monroe, 2000; Dewey, 2007; Freire, 2000; Kolb, 1984; Littledyke & Manolas, 2010; Milovanović, Minović, Lazović, & Starčević, 2008; M. K. Smith, 2011).

2.4 THEORY OF CHANGE

This work is situated within the context of a creative practitioner's examination of enacting a change agenda through practice-based explorations of agency and action. Thus herein, the established *Theory of Change* methodology—that encourages a practitioner to provide specific and measurable descriptions of a social change initiative (Brest, 2010)—has been employed in framing the foundational methodology underpinning this research.

Heracles, the 500BC philosopher, describes change as part of a constant universal flux, stating; no man can step into the same river twice (Graham, 2011), positioning change as neither definable nor tangible per se, but rather an ever-shifting force that drives, defines and creates reality. To this end, one makes the world as much as the world makes us, experiences are change-in-action, and one is always in a dynamic and constantly evolving relationship with existence. This allows one to consciously participate, to intervene in the shifts and flows of the systems at play.

Fundamental to this meta view of change is an understanding that the world is made up of interconnected and dynamically evolving systems, and that one can consciously intervene in their shifts and flows as part of a change-making praxis.

The primary agenda of this work is to shift perceptions and actions of design practices towards more socially and environmentally sustainable outcomes. The method of active production employed herein seeks out opportunities for such system interventions—be it in education, professional practices, social norms or institutional constructs—and more specifically, designing experimental projects that seek to generate shifts in collective conventions and to provoke and inspire this mode of practices in others.

The process of enacting change in and through the things that one does, is a lived experience manifested in the ways in which one enacts their practice. In the case of this work, change is the embodied experience that is lived and sought; each act of intervention, every presentation, project or event changes the practitioner, their practice, their ideas and their tactical ways of operating – this is change in action. In this context, *change* is referring to 'positive social change' as defined by The Blackwell Dictionary of Sociology as "(...) any alteration in the cultural, structural, population, or ecological characteristics of a social system such as a society" (Ritzer, 2007, p. 285).

Herein, change is the embodied experience that is lived and sought. Each act of intervention, every presentation, project or event changes the practitioner, their practice, their ideas and their tactical ways of operating—this is change in action. Through the act of practicing, I embrace the role of passionate change-maker, and seek to evoke intrinsic and transformative change in others via the

development of designed interventions evolved through the experience of actively engaging with social change.

The interventions developed, participate in and work to amplify the re-framing of sustainability as an opportunity to be embraced and not a problem to be avoided. This is enacted through the design and development of activated 'tools' (the Projects) that I, and others employ in a pro-sustainability focused practice. Outcomes of such an approach are often unpredictable and unmeasurable, given that cause and effect are not related closely in time nor space (Peter Senge, 2006). However, the tools do provide an understanding, at least in part, of how the project-based interventions have achieved a certain leverage or level of change within the practices of others when one receives direct feedback (via email or in-person), or by the observation of uptake, application and amplification of the tools and tool creation methods by others.

Thus, the underlying constructs of this research's Theory of Change, frames *change* as a dynamically evolving and responsive force that is participated in and prescribed to by agents within society. Social change comes about through the influencing of collective conventions and social practices. This being the core objective of this practice, seeking out opportunities for systems interventions that create shifts towards sustainability in dynamically evolving cultural systems of practice.

These objectives require the development and commitment of an ongoing practice that incorporates actively trying to predict, read, and shape the zeitgeist—aiming to understand and applying cultural timing appropriately and expertly—to be a dynamic participant in change, as well as an astute observer of change in action.

By synthesizing, integrating or incorporating experiences, one can translate experience into useful, tactical ways of interacting in and with change. This dynamic relationship allows for a practice of action-evolution, of creative production that allows embedded observation to breed active interventions and provide effective feedback, allowing for dynamic responses into the evolution of actions. Practice interventions may exist in a rigid or fluid form, but they are produced to embrace ongoing adaptation and organic amplification through the actions of others. Thus, it is hard to define change impacts or outcomes other than the translation of direct experiences.

2.5 PRO-SUSTAINABILITY CHANGE

The need to address the social and environmental issues facing humanity is not new by any means. There has indeed been much work⁹ detailing the problems that we collectively face if we are to continue with a 'business as usual' approach to the commodification of natural resources in the facilitation of continual growth through modern consumerism (Beder, 2000; Mont & Bleischwitz, 2007; Shove & Warde, 2002; UNEP).

Seeking to incorporate the 'ability' to 'sustain', the conjoined word 'sustainability' has taken on a new cultural meaning which Kiss (2011) describes as, to simply mean 'good', resulting in the word often being misrepresented and misunderstood (Marshall & Toffel, 2005). It is currently plagued by definitional controversies (Mulvihill & Milan, 2007) and is soaked in myths which have been constructed as much by its protagonists as by its advocates. From a constructionist perspective, the buy-in of these myths and symbolic actions (by the public, governments and industry) is to maintain our ontological security (Giddens, 1984). This is further perpetuated through current techniques used to communicate the sustainability agenda—fear, scare tactics, moral panics and morality (Mulvaney, 2010). There has been recent literature (Mulvaney, 2010; M. Nisbet, 2010; O'Neill & Nicholson-Cole, 2009; Ruitter et al., 2001) exposing these approaches to be largely ineffectual and in some cases (O'Neill & Nicholson-Cole, 2009), having a completely opposite result—people feeling so despondent about the environmental issues that they become even more hedonistic.

This has resulted in what I would call, a crisis of confidence in the word itself, and in the goals of sustainability. It has a long and complex history (Mebratu, 1998), is seen as oxymoronic (Redclift, 2005), and has been largely appropriated as a mask for the perpetuation of un-sustainable practices (Beckerman, 1994). Without going into the details of the historic development of the environmental movement¹⁰, it should be noted that it was the second wave environmental movement of the 1960's, filled with anti-establishmentarianism that paved the way for the modern incarnation of sustainability. Allow me now to briefly explain the historical progression of this word and its current framing and thus positioning within the wider discourse.

The 1972 book *Limits to Growth* (Meadows, Goldsmith, & Meadow, 1972) is often attributed to ushering in the 'sustainability movement' (Banon Gomis, Guillén Parra, Hoffman, & McNulty, 2011):

⁹ There are considerable discourse in this space from leading authors including Brundtland (1987), Hamilton (2010), Kiron, Kruschwitz, Haanæs, and Velkin (2012), Hawken, Lovins, and Lovins (1999), Vallance, Perkins, and Dixon (2011) and Wackernagel and Rees (1996).

¹⁰ McManus (1996) and J. Robinson (2004) both provide detailed historical analysis of the environmental movements and its relationship to sustainability. Ricketts (2010) explores the influencing factors of the other progressive social movements of the day such as the civil and human rights movements

“We are searching for a model output that represents a world system that is: 1. *sustainable* without sudden and uncontrolled collapse; and 2. capable of satisfying the basic material requirements of all of its people’s” (p.158).

In 1980, the International Union for the Conservation of Nature, presented the *Living Resource Conservation for Sustainable Development* report to over 34 countries (Grober, 2003), yet it was not until the 1987 *Our Common Future* (referred to as the Brundtland Report after the main author) was the word *sustainability* used to frame the commitment of overcoming negative impacts associated with overconsumption and natural resource exploitation; seeking to position a new way of economically developing within the Earth’s carrying capacity.

The definition for Sustainable Development provided in the Brundtland Report, and widely quoted today is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland, 1987, p. 43). It was however, not until the 1992 Earth Summit in Rio de Janeiro that Sustainable Development became an agreed upon global strategic solution to the mounting social and environmental issues acknowledged during the Summit. Since then, there has been an increasing and somewhat flexible use of the word with the individual term ‘sustainability’ having largely replaced Sustainable Development. Robinson (2004) sees the Brundtland approach as being intrinsically linked to continual growth, and thus presents the isolated term *sustainability* to be used to focus attention “(...) on the ability for humans to continue to live within environmental constraints” (p. 369).

Within the debate around sustainability, there is an inherent tension between anthropocentric and ecocentric perspectives, with much discussion on the meaning and conceptual propositions that sustainability offers¹¹. For example, Kiss (2011) argues for the removal of the economic and social elements as they add conflicting objectives, returning to just ‘ecological sustainability’, yet, I am inclined to agree with Morelli, regardless of what the approach posits, “there should at least be agreement that ensuring the provision of clean air, clean water, and clean and productive land is foundational to a responsible socioeconomic system” (2013, p. 4).

For many people, myself included, sustainability has come to represent an ideology of social, environmental and ethical conduct in business and society at large and representative of the interdependent relationship between nature and human society (J. Robinson, 2004).

¹¹ Several authors discuss the theoretical positioning of sustainability (Banon Gomis et al., 2011; Becker, 2012; Kiss, 2011; Morelli, 2013; Sen, 2013; Sneddon, Howarth, & Norgaard, 2006; Mark White, 2013).

Grober (2007) constructs a fascinating narrative of the deep rooted foundations sustainability has enjoyed in the European Enlightenment Movement, and for all of its vagueness and controversies, the Brundtland definition has been instrumental in developing the goal of a shared worldview of a more equitable future for the planet (Mebratu, 1998). Mebratu makes the added point that throughout history ecological factors have been a driving force behind every social transformation, including the agricultural and industrial revolutions. Thus, the constraints and limitations of the acute environmental issues faced by humanity are packaged through the ambition of *sustainability*. In light of this, I believe there is a strong case for the continued use, yet re-appropriation of the word. This has become a core part of this practice's ambition—to participate in a re-framing of the conceptual baggage surrounding sustainability as part of a change-making praxis in and through design.

Thus in the context of this body of work, the term *pro-sustainability change*¹² is used as an overarching term to describe socially and environmentally equitable change-centric activities, facilitating the concepts discussed by Wackernagel and Rees (2013), Hawken et al. (1999) and Peter Senge (2011). Including, consideration of the ways in which humanity can live within the earth's carrying capacity; working within the limits of natural resources and ecosystem services; increasing social/human equity and justice; and finding economically viable ways of redirecting production systems to be closed-looped, waste minimising and regenerative.

For Corral-Verdugo (2009) a pro-sustainability orientation is one which involves "(...) the set of dispositional and behavioural variables that characterise environmentally responsible individuals" (p. 655). This notion of responsibility is carried through the wider discourse on sustainability (Elkington, Senge, & Yunus, 2011; Ursula Tischner, Stø, Kjøernes, & Tukker, 2010) especially with regards to Corporate Social Responsibility (CSR), which has largely become the 'business case' for sustainability in industry (Carroll & Shabana, 2010). Yet the by-product of this has been the diluting of the word and conceptual frame within which it is housed, to a point of fatigue.

There is a commonly held belief within the pro-sustainability community that education will lead to action (Hungerford & Volk, 1990; Kollmuss & Agyeman, 2002) yet, "research shows that people who take positive environmental actions often have no better understanding of the problems than those who don't act" (Day & Monroe, 2000, p. 3). This cognitive dissonance (Festinger, 1962) between beliefs and actions is a well-documented phenomena (Kagawa, 2007; Rabin, 1994; Thøgersen, 2004), contributing to the lack of environmentally preferable actions, and presents the

¹² Pro-sustainability is discussed within literature in relation to behaviour change (Corral-Verdugo et al., 2009; Kagawa, 2007; Maiteny, 2002; Taylor & Allen, 2008), education (Condon, 2004), attitudes and actions (Littledyke & Manolas, 2010; Sheppard, 2006) and is set up as the opposite to anti or un-sustainable practices (Handfield, Melnyk, Calantone, & Curkovic, 2001; Starik & Rands, 1995).

fundamental question of how to effect change—should the focus be on behaviours, attitudes or social structures?

This question has played out through this research and feeds into the overarching research question, of how pro-sustainability change can be enacted through a disruptive design practice, which is inherently interested in testing methods for actively making change through divergent offerings, interactive experiences and constructed avenues of engagement such as games and performative presentations that implicate the audience in the act of making those changes. Critical to this, is the role that I play as a change agent, developing modes of operating that empowers this change-making agenda by embodying and reinterpreting methods through a variety of different mediums.

2.6 BACKGROUND TO THE SUSTAINABLE DESIGN FIELD

The last two decades have seen much written on the topic of environmental considerations in design, providing a plethora of definitions, propositions and models. Indeed, the debate on terminology is still being waged (Sherwin, 2004), but for the purpose of this research, the terms ‘eco-design’, ‘sustainability in design’ and ‘design for sustainability’ are all used interchangeably to mean “(...) the integration of multiple competencies in order to generate and implement creative interventions that trigger positive changes in complex socio-technical systems (...)” (Sosa et al., 2010, p. 1).

The birth of environmental considerations in design is often said to have started in the nineties with the ‘design for x’ applications to manufacturing and engineering design (Kuo, Huang, & Zhang, 2001). Victor Papanek’s *Design for the Real World* (Papanek, 1971) published in the early seventies, laid the groundwork for this movement; calling for stewardship of the natural environment, his critical dissection of the industrial design community, stating it lacked social considerations and contributed to the decline of the natural environment. Papanek’s work initially had little significant impact on the design industry (Margolin, 1998) however, later he would be recognised as a social influencer, design provocateur, and a critical contributor to the advancement of sustainability considerations in design (Clarke, 2011; Leerberg, Riisberg, & Boutrup, 2010b; Müller, 2012).

Years earlier, R. Buckminster-Fuller (1973; 1962) had also been promoting ecologically sensitive design principles through his pioneering work and radical rethinking of the way in which cities, buildings, cars and everyday objects were designed (Cross, 2001). Fuller, Papanek and Schumacher (1973) certainly introduced the notion of social change to the design community (Fletcher & Goggin,

2001; Vogel, 2009). Despite this early start, and many contributions in the following years¹³; Margolin (1998) declared in the late nineties that these ideas had never fully penetrated the “(...) underlying premises of design practice, that the role of the designer is to work within the system of consumer culture and to provide services to his or her clients” (1998, p. 85).

The nineties see a considerable growth in eco-design (Pigosso, Zanette, Filho, Ometto, & Rozenfeld, 2010) and ‘green design methods’ (Clark, Kosoris, Hong, & Crul, 2009), along with advances in cleaner production (OECD, 1995), eco-efficiency (Ehrenfeld, 2005) and industrial ecology (Ehrenfeld, 1997). This decade also saw several milestone developments that assisted in the growth of eco-design¹⁴. In 1992 the Industrial Designers Society of America (IDSA) published the *12 Facts about Eco-design*, and then the voluntary European Ecolabel scheme was set up (Hübner, 2012). In 1995, the Dutch government introduced a policy intended to stimulate the eco-design of products (Ammenberg & Sundin, 2005) and around the same time the German Packaging Ordinance (Livingstone & Sparks, 1994), and other product-related policies were introduced in Europe (Scholl, 1996). These early policy developments contributed to the 2002 international eco-design standard ISO 14062 (Lewandowska & Kurczewski, 2010) and today there are many eco-design related policies around the world¹⁵.

Much of the design for sustainability propositions during the nineties and early 2000’s were developed by university research centres and large corporations (Ammenberg & Sundin, 2005; Casper Boks & McAlloone, 2009; Clark et al., 2009) promoting the uptake of eco-design methods (such as design for disassembly, design for longevity etc.) and assessment tools (such as ecological foot-printing and life cycle assessment). In Australia, the Centre for Design at RMIT was established in the early nineties and developed a range of Eco-Re-Design programs between 1993 and 1997 (Ryan, 2003) which led to the publishing of a design for sustainability method book *Environment + Design* (Lewis & Gertsakis, 2001). At this time, the Netherlands TU Delft University set up the Design for Sustainability Program (Brezet, Stevels, & Rombouts, 1999; Clark et al., 2009) contributing the PROMISE eco-design methods (Brezet, 1997). Other significant contributions have since been made by Luttrupp and Lagerstedt (2006), Vezzoli and Manzini (2008), McDonough and Braungart (2002)

¹³ Such contributions have been made by Behrisch, Ramirez, and Giurco (2010), G. Johansson (2002), Luttrupp and Lagerstedt (2006), Wimmer (2008), Casper Boks and Diehl (2006), Lewis and Gertsakis (2001) and Brezet and van Hemel (1997).

¹⁴ A very detailed historical discussion of these developments is provided by Casper Boks and McAlloone (2009).

¹⁵ Such as the European Union’s Waste Electronic and Electrical Equipment Directive (Gottberg, Morris, Pollard, Mark-Herbert, & Cook, 2006), and their Energy Using Products Directive. Similar policies are also in Taiwan, Korea, Brazil and Peru (Hanisch, 2000; Toffel, 2003).

with the 'cradle to cradle' methodology and Benyus (1997) who popularised the 'biomimicry' design approach.

Despite over fifteen years of expanded sustainable design methods and tools, issues with uptake and lack of integration into the design process started to be identified (Casper Boks, 2006; Knight & Jenkins, 2009; Lofthouse, 2006; Tingstrom & Karlsson, 2006; Waage, 2007). Baumann, Boons, and Bragd (2002) said there had been much talk of environmental product development but few changes to design practice with Boks and McAloone (2009) attributing this in part to the historical transitions that eco-design had evolved through and more specifically, "Several industry experiences revealed that despite their enthusiasm, industrial designers did not know how to go about developing eco-design concepts into realised products that could be successful in the market" (p. 434).

From 2000 onwards, eco-design saw a rapid expansion with the incorporation of more holistic, systems-based sustainability principles, giving rise to the field of 'product service systems' known as PSS (Casper Boks & McAloone, 2009). This field of practice has evolved into contemporary enactments of what is called the 'service economy' and more recently the re-framing of this as the 'circular economy'¹⁶ which incorporates a variety of design for sustainability methods and proposes shifts from linear to circular business and value systems. This practice has its foundations in the desire to shift the ways in which eco-design is embraced by the design community to be a core part of practice, rather than an optional addition.

Within a broader context, sustainable design is positioned under the overarching field of Sustainable Production and Consumption, which itself sits within the field of Sustainable Development and, as mentioned in section 2.5, the latter is the (contested) foundation of sustainability. This arena encompasses an array of subcategories seeking to achieve the broader goal; such as cleaner production (Almeida, Bonilla, Giannetti, & Huisingh, 2013), lean manufacturing (M. G. M. Yang, Hong, & Modi, 2011), corporate social responsibility (D. Brown, 2013), eco-efficiency (Ehrenfeld, 2005), industrial ecology (Jelinski, Graedel, Laudise, McCall, & Patel, 1992) and product stewardship (Ammenberg & Sundin, 2005). Eco-design is also one of these subcategory fields that has contributed to the development of policies including the European Commission's *Sustainable Production and Consumption Action Plans* (European Commission, 2013).

¹⁶ Although the identification of the Circular Economy has been discussed academically since the nineties (Andersen, 2007; Ning, 2001), it's recently seen a considerable increase in popularity, particularly in China and the United Kingdom (Giurco, Littleboy, Boyle, Fyfe, & White, 2014).

This work sits within the broader context of Sustainable Production and Consumption, with much of the content of the Educational Tools and Games having both adopted and adapted critical concepts of the subcategory fields. Additionally, it seeks to create opportunities for framing and communicating methods that qualify and encourage uptake of pro-sustainability decision making within design and user practices.

My introduction to the field of sustainability in design was through Papanek in 2002 when I first read *The Green Imperative* (1995). This encounter dramatically changed my perspective on design and inspired me to embark on the development of an eco-design based practice. I came to the understanding that human choices had significant ramifications on the natural systems and services that sustain life on Earth, and that as a designer, I would be making choices that would place demands on natural resources, produce waste, and potentially cause irreversible ecosystem damage. These realisations altered my outlook on design practice and fundamentally shifted my worldview prompting my departure from design school and the embarkation of an undergraduate degree in Social Science majoring in sustainability, specifically in order to develop an eco-design practice¹⁷.

After completing the Social Science degree, whilst employed at RMIT's Centre for Design I worked on the development of a range of new projects to increase uptake of sustainable design within the design and business communities. One such project was *Greenfly* (Acaroglu, 2009; CfD, 2009), the quick online life cycle assessment tool for designers, and the *What is Eco-design Toolkit* (Business Victoria, 2013) which provided eco-design strategies for use during the design process across three key design disciplines (graphic, industrial and fashion). It was at the Centre for Design that I first encountered life cycle assessment (LCA), which is now considered to be part of a best practice approach to integrating sustainability into design (Pigosso et al., 2010; Sherwin, 2004) and this approach has contributed to a large part of my theoretical position and approach to professional practice.

Through investigations and work conducted whilst at the Centre for Design, it became evident to me that one of the issues with uptake was due to the lack of 'design' in the materials developed for the design community. Research conducted by Mawle, Bhamra, and Lofthouse (2010) into how designers obtain sustainability information found that sustainability resources and tools need to be well designed, with easy to use interfaces and avenues for integration into the design process (Mawle et al., 2010). This sentiment is echoed in research by Casper Boks (2006) along with Karlsson and

¹⁷ During a TEDx Melbourne talk in 2013, I detailed this experience explaining how a single moment dramatically changed the trajectory of my professional practice and personal perspectives. This can be viewed at <https://www.youtube.com/watch?v=5IOSIHWOp2I&noredirect=1> from time code 10.30.

Luttrupp (2006); namely that communication and cooperation are critical factors in successful uptake of eco-design. Many of the initial project explorations that I embarked upon, such as the *Secret Life of Things*, the *Mythbusting App* and the *Design Play Cards*, experimented with different ways of arranging information, of breaking down existing eco-design strategies into 'chunks' of information, and presenting them in visually interesting and multi-functional ways. In her research into eco-design uptake, Lofthouse (2006) found the need for information to be presented in a visually appealing manner, with text being arranged in 'nuggets', and for scientific/academic jargon to be avoided. These types of communication methods have been explored throughout this body of work, testing different modes of re-framing sustainability in design.

At the start of this PhD research, a series of in-depth interviews were conducted with recent graduates and professional designers working in Australian design consultancies (Acaroglu & Fennessy, 2012)¹⁸, exploring the barriers and obstacles to eco-design uptake. The results of this research (detailed in Appendix 1), demonstrated the complexity of issues that affect the integration of sustainability strategies in design practice. The variety of barriers identified include organisational culture, clients, financial/time restraints, company structures, economic disincentives, cynicism and a lack of demand (Acaroglu & Fennessy, 2012). Past studies conducted by van Hemel (1998), Hutchinson and Hutchinson (1995); Knight and Jenkins (2009) and Gerstenfeld and Roberts (2000) concur with these findings, with Mawle et al. (2010) identifying over thirty different obstacles to implementing sustainability in design.

Needless to say, there are a variety of subtly complex issues at play when considering why the design industry has still not widely adopted a sustainability motivated praxis. However, in recent years there has been an increase in the penetration of design for sustainability principles in design education across curriculums (Blewitt & Cullingford, 2004; G. Jones, 2013) from high schools (S. Robinson & Mangold, 2013; VCAA, 2011) through to universities (Ramirez, 2007, 2012) and increasingly, firms are offering sustainability related services.

There is much discussion of the methodologies, programs, techniques and curriculum materials developed in aid of eco-design education¹⁹, with such rich contributions to the field, there is little

¹⁸ Ethics Register Number CHEAN A-2000562-08/11 this research looked into the motivations of recent graduates and professional practitioners across the industrial design landscape in Australia and sought to gain a more detailed perspective of the experiences of why/why not sustainability considerations were being included as a core part of the design practice. The findings demonstrated a series of barriers such as the hierarchical nature of the design industry, lack of client desire and deflection of responsibility. More details provided in Appendix 2.

¹⁹ In recent years there has been an increase in the penetration of design for sustainability principles in design education across curriculums (Blewitt & Cullingford, 2004; G. Jones, 2013) from high schools (S. Robinson & Mangold, 2013; VCAA, 2011) through to universities (Ramirez, 2007, 2012). Further discussion is provided by (Badni & Coles, 2003; Bergea, Karlsson, Hedlundstrom, Jacobsson, & Luttrupp, 2006; Bhamra, Lofthouse, & Norman, 2002; Casper Boks & Diehl, 2006;

need to rearticulate it here, except to say that this work seeks to contribute to this discourse through the synthesis and articulation of divergent methods of communicating sustainability in design. Also, the recent rise in popularity of the service and circular economy movements has helped to create a language of relatable concepts that bridge the gap between design production and consumption. The Project based interventions undertaken through this practice, have sought to participate in this conversation.

2.7 DISRUPTION, INTERVENTION AND TACTICS

Conceptually, disruption is inherently about disturbing or interrupting a normal course of events so that the trajectory is forever shifted. Christensen's (1997) proposition of 'disruptive innovation' in business has led to a range of 'disruptive' adaptations to business practices, whereby competitors are challenged through the addition of simpler, cheaper or newer propositions into the market place. This is not how disruption works within this practice. Herein, the notion of disruption lies in a different space. To disrupt is to be intentionally rebellious, to embody a practice of provocation. An intentionally Disruptive Design Practice is one that re-directs the approaches that creative practitioners and active doers use to intentionally identify and effect positive social change in the world through the things that they create. Like any other form of growth and change, disruption is a learnt process that involves using tools to assist with both the thinking and the doing.

Throughout this research process I have been developing an intentionally disruptive practice. Early on I was not aware that this was what I was doing, and the allowance afforded through being 'intentionally' disruptive has encouraged and empowered me so much more than a simple rebellious streak—it has enabled my ability to enact pro-sustainability change through my work, and resulted in an evolving practice that intentionally intervenes into an identified system to leverage positive change outcomes.

Interventions are intentional incursions, propositions or provocations (Harper, 1998) enacted through a multitude of mediums, actively seeking a reaction as the result of an action. Pursuing change effects is in itself an interventionist act. The Oxford English Dictionary defines interventions as actions taken to *improve* a situation. In her article "Places to Intervene in a System" prominent systems thinker Donella Meadows discusses these as 'leverage points', the places within complex systems where small shifts can produce significant changes. Buckminster Fuller likened these points to the trim tab on a boat, the tiny part of the rudder that when moved would dramatically shift the direction of a

Casper Boks, Diehl, & Wever, 2009; Clune, 2009; Diehl & Brezet, 2005; Huang, 2007; Humphries-Smith, 2008; Leerberg, Riisberg, & Boutrup, 2010a; Lofthouse, 2009; Vezzoli, 2003; Watkins & Lofthouse, 2010).

large vessel. In Systems Thinking, leverage points are the counterintuitive places where one can intervene in order to effect change.

To this end, I use the phrase 'disruptive intervention' instead of 'disruption innovation' to describe the act of intentionally intervening in a system to evoke for positive social change. Through the lens of enacting a change-focused agenda, a disruptive intervention can be designed and implemented in tactical ways – this approach has emerging from the exploration and mining of the Projects.

Christensen's ideas of disruptive innovation have had significant amplification throughout the business world, most recently adopted as the buzz phrase in the technology and start up sector. There has been a spate of articles calling for a stop to the overuse of the word 'disrupt'. Headlines read "Stop Disrupting Everything" (Yglesias, 2013), and from the academic community there have been critiques of the framing (Danneels, 2004; Markides, 2006) and the conflicting nature of the literature (Yu & Hang, 2010). However, I am not alone in arguing the case for a framing of a 'Disruptive Design Practice', indeed, Moser (2013) has done so in his proposition "Architecture 3.0". In essence, Moser's disruption is a reaction to the global financial crises, as part of a reimagining of the Architectural field, he calls for significant change through a rediscovery of systems and network effects; proposing a conceptual and practical split between 'designing-for-solutions' and 'designing-for-building'. He opens his book with a discussion of the evolution of Christensen's disruptive innovation frame through the lens of Schumpeter's 1942 'creative destruction'. For Schumpeter the business cycle of innovation is a process of industrial mutation from within, which destroys the old and fosters the new (Schumpeter, 1942) and for Moser, Christensen's disruption is an extension of this destruction. The above defines the framing of 'disruptive forces' reshaping business processes, but is very far from the approach that this practice takes, perhaps only in the desire to cause effect does disruption have the same foundations—but in this re-framing, disruptive interventions are acts designed to effect shifts within an identified system in order to leverage and effect positive social change.

The term 'disruption' has suffered similar overuse fatigue as the word 'sustainability'. Just as I argued in Section 2.5 for sustainability to be re-appropriated, I have argued here that disruption, as a conceptual framework needs to also be re-framed to encompass all that use and can benefit from it. While the terms 'sustainability' and 'disruption' may not be used in perpetuity, they should also not be completely abandoned. Thus, this practice embodies an attempt to re-frame these two critical terms, to adopt a positively framed approach to what it means to lead with an agenda, and to intentionally disrupt for positive change. Within this, the terms are themselves being disrupted through their re-appropriation. It is my hope that others will do so too, and that collectively we may provide a re-valuing of these linguistically powerful terms.

In the 1990's, Michel de Certeau's framing of Tactics influenced the Tactical Media movement, encompassing a practice of interventionist creative subversion through do-it-yourself media activism (Garcia & Lovink, 1997). The Critical Art Ensemble explained Tactical Media as an emerging 'politicised interdisciplinary practice' (Kluitenberg, 2011), a form of 'digital interventionism', with the acts not being limited to digital mediums. Instead Tactical Media, according to Kluitenberg (2011), is shorthand for copying, re-presenting and re-combining the "(...)appropriation of any kind of medium, any form of knowledge or visual production, and any social or political process, challenging hierarchies and false dichotomies as it goes along" (p13).

Tactical Media operates as a political practice seeking to loosely define ways of incorporating 'weaponry' into a tactically motivated artistic practice. The act of tactical intervention fits within this practice, yet the works I produce do not seek to operate as a 'protest' they seek to leverage and amplify opportunities for divergent ways of doing. This could of course be seen as activism, but in fact, I am intentionally not adopting the framing of an 'activist' in the traditional sense, rather the productions that I create, and the practice with which I embody those productions is all about provocation, agitation and conversation—these are the disruptive interventions enacted through a systems thinking framework.

2.8 COMMUNITY OF PRACTICE

There are a range of practitioners whose work involves interventionist elements from whom I have drawn for inspiration through exploring their creative approaches to communicating social and environmental change. Wenger's (1999) frame of a 'community of practice' being formed by people engaging in collective learning, and shared through a domain of human endeavour, has been drawn upon here in presenting these practitioners.

Annie Leonard's (Leonard, 2010) work seeks to effect change through divergent ways of communicating and transferring knowledge around sustainability issues. Her widely watched *Story of Stuff* animation series and book explains complex environmental and social issues around consumption and production. Similar to the work of this practice, Leonard distils and reframes scientific information using an engaging style of communication that employs entertaining animations with combined educational resources²⁰.

Natalie Jeremijenko, an engineer and artist (Weiner, 2013), creates immersive and interactive creative arts/science installations that challenge people's perceptions about humans, nature and

²⁰ Leonard's work was a seminal influencer in the development of *The Secret Life of Things* project.

ecology. Her imaginative work has included; *Amphibiose Architecture* where LED fitted buoys in the East River in New York City flash when fish swim past. People can also subscribe to receive SMS alerts from the fish, which involves quirky personified characters. *Mussel Choir* uses the organisms to collect water quality data, realised in real-time and communicated to the public (Newcombe, 2013), and through the *Environmental Health Clinic* (Jeremijenko, 2014), Jeremijenko prescribes environmentally focused designed interventions to 'inpatients'. Her work has been described as reimagining environmentalism as an open-ended game (Weiner, 2013), yet she herself describes her work as being concerned with "a crises of agency rather than the traditional language of consume less and reduce your food miles" (Weiner, 2013). Overall, Jeremijenko's work is designed to elicit an imaginative response in the participants and challenge their perceptions of ecological services, re-framing values through propositional works.

Dan Lockton is an architect interested in how design can influence and affect human behaviour and generate pro-sustainability outcomes. His work has resulted in the development of a card based design method tool: *Design with Intent* (Lockton, Harrison, Holley, & Stanton, 2009), which takes complex ideas around influencing behaviour through design and provides the designer with a provocation into the design process, seeking to generate more pro-sustainable outcomes.

Jonah Sachs (Sachs, 2012), founder of Freerange Studios (who worked with Leonard to create *The Story of Stuff*) uses storytelling in unique ways to reframe sustainability messaging. *The Meatrix* animation was an experiment with entertainment and advertising for social change, which Sachs describes as a spoof. It went viral online becoming a 'cultural phenomena' which Sachs attributes to the leveraging of mythologies with whom people identify (Sachs, 2012, p. 3). Sachs's work effectively utilises metaphor, narratives and cultural currency to communicate change. Through storytelling, he has created a practice that utilises marketing as "a powerful force for good" (Sachs, 2012, p. 5).

Whilst these practitioners come from a variety of design and non-design backgrounds, they employ unique methods of communicating social change, many of whom employ similar tactics and embody the same objectives to those of this practice. Their work is intentionally interventionist (Engeström, 2000) in nature, using smartly applied approaches to create conversations and actions around social and environmental change.

2.9 CHAPTER 2 - CONCLUSION

This chapter has, through an examination of the literature relevant to this PhD research, framed the context from which it has been produced and defined. It has presented the Theory of Change that underpins this work, and has argued for the re-framing of the terms sustainability and disruption. Throughout this chapter the constructionist epistemological position and the grounding within a systems thinking worldview, has been demonstrated, presenting the foundations from whence this practice's motivations and approaches have come, as well as framing the arena in which I have gone about answering the research question. To this end, previous knowledge and experience relating to this practice was discussed with regards to its role in developing a particular type of change-centric design practice focused on influencing and affecting the ways in which sustainability can be communicated within design.

In seeking to enact this change-making agenda, the use of disruptive interventions as agents of change and the community of practice around this approach has been framed. The construct of pro-sustainability change has been positioned as both the objective and the vehicle within which this work is approached, intentionally anthropocentric, whilst inherently respecting the natural constraints and limits within which humanity live. I take the fundamental view that everything has intrinsic value outside of human projection, yet in order for humanity to continue to survive prosperously into the future, actions must be taken to reduce negative ecological impacts that current human activities have on the natural systems and services which keep the planet functioning and prospering. In this context, pro-sustainability is about effecting change in and on the systems that exist both socially and environmentally.

3. THE PROCESS

3.1 CHAPTER 3 - INTRODUCTION

The Projects explored through this body of work have enabled a series of systems interventions to be expressed in a variety of forms. As part of the Disruptive Design Process developed from these practice explorations and outlined in section 5.3; these designed interventions have been informed and motivated through theoretical explorations, specifically with regard to the social and psychological foundations of constructed society and the modes of operating within everyday life.

Within this Chapter lies an exploration of the social and practical theories relevant to the building of this practice and a discussion of how this has affected the ways in which practical outcomes have been employed. Reflecting on theory and in-practice experimentations with theoretical understandings has been critical to this action research inquiry cycle employed in addressing the research question.

3.2 DESIGN PROCESS AND METHODS

Design is a powerful tool for communicating values and perceptions of the world and plays a significant role in creating contexts in which we understand social activities and norms (Sudjic, 2008). Lawson (2006) explains design is hard to define given that it is both a verb and a noun pertaining to products and processes. With no single definition, it remains elusive and 'surprisingly flexible' (Buchanan 1999), yet in this world of designed artefacts and experiences, designers create new meanings and narratives that are amplified through the relationships and values placed upon them (Julier, 2007). We encounter much of the world through designed 'things', yet the design of our world is a 99% invisible force (Mattern, 2014) allowing the act of designing to play a very powerful and influential role in constructing social norms and opinions. Harnessing this power is a tactical way of effecting pro-sustainability change (Ehrenfeld, 2008), and one within which it is actively engaged throughout this practice.

Whilst Victor Papanek (1971) determined that design was enacted by all people and part of the underlying matrix of life, much of design in a professional context is concerned with configuring the material world to meet human needs and desires. Materiality is a cornerstone of modern consumer society and with materiality comes *status anxiety* as discussed by de Botton (2004) leading to

Affluenza (Denniss & Hamilton, 2005; R. Johansson, 1987), conditions that bring to light ways in which material aspirations and social norms shape our everyday lives, all to which design is beholden. For Latour (2005) this is to do with how much of our lives are scripted through the things that we encounter—artefacts, the built environment and material experiences. These all affect our movement and behaviour, configuring our personal aspirations. It is the ordinary things that “(...) are extremely important in sustaining and transforming the details and the design of everyday life” (Shove, Watson, Hand, & Ingram, 2007, p. 2). To this end, the content of the Performative Presentations and the Educational Tools contextualise these ideologies and make relevant the ways in which pro-sustainability change can be integrated and embedded within design process and practice.

Design operates as a social influencer, scripting behaviours and creating conventions (Shove et al., 2007). The notion that material goods are inanimate, lifeless objects that exist simply to serve human needs, perpetuates a disconnection between humans and the natural world. All things come from nature. At some point everything was part of a natural system prior to being formed into material goods and moved into the industrial system serving human needs. The challenge lies within collective perceptions of material worth and the ways in which the material world continues to script human behaviours. This work takes the position that design both causes and solves problems. It is a value-led activity that is inherently based on creating and effecting change, intentionally or not. In creating design, designers impose values and agendas upon the world, their own or those of their clients. Being a designer comes with a certain cultural responsibility as Press and Cooper (2003) discuss, it is designers that create culture, experience and meaning for other people. Yet design can be an intentional provocation and defiant act, as described by Fry (2009) in *Design Politics* where he calls for designers to redirect their practices. Thus, if design shapes and scripts, then it is here within the act of designing that tactical ways of making change can and should be integrated, embedded and perpetuated. This is the framing that the content of this work seeks to affect; positioning and framing design as an agenda-led tool of social influence, one that the designer can employ to effect change in the world through the things that one does.

There are many ways to describe the processes that designers use; with design often being described as a ‘rational’ problem-solving technique (Dorst & Dijkhuis, 1995), although this is criticised as being reductionist by commentators such as Fry (2009). Gagnon, Leduc, and Savard (2012) define the structured Design Process as commonly including problem definition, generation of concepts, selection and refinement of potential design solutions. An alternative way of defining Design Process’ was introduced by Schon (1983) who proposed the constructionist theory of ‘reflection-in-action’ whereby the design practitioner employs a reflective conversation with the situation (Dorst, 2006). The situational aspect of design accounts for the experience of the designer

in influencing the design activity. For Doorst (2006), “Designers work by framing a problem in a certain way, making moves towards a solution” (p. 271). These are evaluated on the criteria of coherence, accordance and the problem-solving value, arguing that design is both the rational problem solving process and reflection-in-action. The latter is true of this practice; the act of problem identification and exploration are done through a reflection-in-action process, and as outlined in Section 5.3, this in-practice reflective method has bred the articulation of a Disruptive Design Practice.

Whilst the term ‘design thinking’ has been discussed since the seventies, it has become a somewhat overused buzz phrase over the past decade (Dorst, 2011; Woudhuysen, 2011). Promoted by its proponents Brown (2008) and Cross (2011), the term has been used to describe a way of problem solving that employs processes and tools drawn from designerly knowledge that can be applied to many scenarios. Design Thinking seeks to formulate a definable process of creative inquiry that can be adopted by so called ‘non-designers’ (Woudhuysen, 2011). And indeed, its modern incarnation is not without controversy, with Nussbaum (2011) arguing that “the concept is doing more harm than good”, with ‘overblown expectations’ (Raford 2010). Ling (2010) describes it as being packaged up like a ‘happy meal’ contributing to the dilution of the design process. Despite these criticisms, over the past decade Design Thinking has penetrated many non-design arenas such as education and business, and consequently contributed to the broadening of opportunities for designerly approaches to problem identification and solving (Beckman & Barry, 2007; Boland & Collopy, 2004; Martin, 2009; Plattner, Meinel, & Weinberg, 2009).

Given this pre-existing framework, this work seeks to adapt popularised terms such as Design Thinking as a frame for carrying pro-sustainability approaches (Young, 2010)—a frame that considers the holistic and systemic impacts on people and the planet that result from activities undertaken in the design, production and consumption of the everyday. Many of The Projects explored in this body of work, such as the *Design Play Cards*, the *Good Design Guide* and the *Game Changer Game*, have built on the success of the Design Thinking framework as a conceptual structure for embedding sustainability approaches. This ‘borrowing’ of culturally convenient terms has allowed what would otherwise have become fringe interventions to be adopted in a more mainstream way; contributing to the tactical ways of identifying opportunities within a system of operating and then seeking out subtle ways of poaching power to fulfil the agenda of effect positive change.

The Disruptive Design Process born out of this work is a Design Method. For several decades now, there has been the emergence of numerous Design Methods, seeking to embrace and demonstrate a shift towards pro-social and pro-environmental considerations in and through design practice. These Methods include, human-centred design (HCD) or user-centred design approaches (Cooley,

2000; Maguire, 2001; Sanders, 2002), collaborative or co-design (Sanders, 2000), participatory design (M. J. Muller & Kuhn, 1993; Schuler & Namioka, 1993), public interest design, universal or inclusive design (Lidwell, Holden, & Butler, 2003; Mace, 1998) and service design (Stickdorn, Schneider, & Andrews, 2011)²¹. These techniques essentially provide practice frameworks and draw on procedures from non-design disciplines (such as sociology, psychology and information technology). For example, the core component of human-centred design (proposed for use in design thinking) has seen the inclusion of the end user or stakeholder in the development of products and services—incorporating ethnographic research, which has been adopted from the social sciences (Saunders 2011).

Writing in the Harvard Business Review, Merholz (2009) argues that the “not-so-secret truth about ‘design thinking’ is that a large part of it is actually ‘social science thinking’”. Schweikardt (2009) points out that user-centred design has become a quasi-religion in design schools, but in fact it is an “incomplete philosophy lacking a sense of responsibility for concerns other than those of the immediate end user” (p. 12), going on to argue that this approach is misguided. Focusing on end-user needs has not resulted in environmentally concerned design (Schweikardt, 2009). This position is aligned with the findings of this practice, which furthermore posits that design predominantly operates as a commercial activity relying inherently on continual economic growth for its own survival. Thus, there is a gap in the availability of practice methods that embody a pro-sustainability change agenda. Therefore, this practice has evolved a method of intentionally disruptive creative practice enacted through a change-making praxis (as outlined in section 5.3).

3.3 DEVELOPING A TRANSDISCIPLINARY PRACTICE

This practice draws together sociological ways of thinking and designerly ways of doing with environmental science practices of life cycle and systems thinking to form a transdisciplinary approach to the practice. Much of the project experimentations have been in aid of the development of a Disruptive Design Practice that enables a change-making agenda. Transdisciplinary practice is commonly concerned with addressing the real-world problems of inquiry as well as bridging gaps in knowledge fields such as social and environmental sustainability (Hoffmann-Riem et al., 2008). The ‘transdisciplinarity’ frame allows for a moving in and through disciplines, developing collaborative relationships and traversing multiple fields of inquiry to develop meaningful and useful

²¹ Further to this there is social design (Burkett, 2012), biomimicry (Benyus, 1997), the cradle to cradle approach (McDonough & Braungart, 2002) and a host of methods for integrating sustainability into design (such as product, service, systems (Manzini, Vezzoli, & Clark, 2001; McAlone & Andreasen, 2004) and sustainable design (Brezet & van Hemel, 1997; Chick & Micklethwaite, 2011; Ehrenfeld, 2001; Shedroff, 2009; Sherwin, 2004; U. Tischner, 2008)

solutions (Wahl & Baxter, 2008), whilst *The Journal of Transdisciplinary Environmental Studies* claims research is only transdisciplinary if it draws upon both the natural and social sciences (Stærdahl & Schroll, 2002). The 'trans' in transdisciplinary literally means to traverse, crisscross and zigzag from side to side (Nègre, 1999), and is principally related to appreciating complexities and seeing the whole rather than the parts (McGregor, 2004). This approach to practice employs a systemic worldview and presents an opportunity for the development of new emergent disciplines (Dykes 2009), facilitating praxis change and assisting with the production of new approaches to problem solving (Hoffmann-Riem et al., 2008).

Whilst there have been many practitioners interested in effecting the social and environmental implications of design on society²², the proposition of 'tactical ways' as presented herein, has not been suggested to date. Perhaps the closest is Fry's (2009) call for *redirective practices* that prioritise sustainment through design. Whilst not prescribing to all of Fry's positions on sustainability and design, the notion of design being political (Fry, 2011) and the re-directing of one's practice towards that of enacting sustainment is inherent to this work. Further to this, the construct of *design as activism* (Fuad-Luke, 2009; Markussen, 2013; Thorpe, 2008), is in line with the propositions put forth herein, yet I do not (as mentioned earlier) adopt the 'activist' title, without any disrespect to those that do, the activist role does not adequately describe the position within which this body of work seeks to act. The Projects seek to legitimise the approaches, not push them to the fringe. To this end, I agree with Morse, Buss, and Kinghorn (2007) who state that "in order to be change-centric, transformational stewards need to be creative, innovative and comfortable with ambiguity and with navigating complex systems" (p. 164).

A transdisciplinary approach to practice as outlined herein forges three disciplines (Stein 2007), merging sociological inquiry with design and environmental sciences to form a new type of tactical approach to design practice that intentionally creates disruptive interventions. In this sense, Lévi-Strauss's concept of bricolage (1962)—the making do with what one has—is appropriate to this practice, also approached by de Certeau (2004) in relation to individuals combining cultural ingredients and putting the bricolage to use for their own purposes (Kimball, 2006). This concept is extended by Louridas (1999) in the presentation of a metaphor for design as being a form of bricolage; by 'making do' with what skills, experiences and resources one has available to them, a bricolage practice is formed, leveraging tactical ways of operating to subvert dominant socio-cultural conditions of un-sustainability.

²² Key authors in this area include Bhamra (2004), Chochinov (2009), Ehrenfeld (2008), Jeswiet and Hauschild (2005), Leerberg et al. (2010a), Lofthouse (2006, 2009), Papanek (1985, 1995), Thorpe (2007), Tonkinwise, 2011 and Vezzoli and Manzini (2008)

3.4 EXPERIENCE AND KNOWLEDGE TRANSFER

Much of this work is interested in exploring divergent ways of transferring knowledge through different educative and communicative mediums. Thus, the question of what makes learning effective is important to unpack. Corresponding with Kolbs (1975) four learning stages, it is said that effective learning requires four different forms of competencies, these being, “concrete experience abilities, reflective observation abilities, abstract conceptualisation abilities and active experimentation abilities” (Boud, Keogh, & Walker, 2013, p. 12). It is through these stages that experience is transformed through reflection into learning. This approach is at its essence, ‘experience-based learning’ (Boud & Pascoe, 1978) that “(...) supports a more participative, learner-centred approach, which places an emphasis on direct engagement, rich learning events and the construction of meaning by learners” (Andresen, Boud, & Cohen, 2000, p. 225).

From this foundation, The Projects have experimented with the creation of experiences that are conducive to intrinsic learning experiences—seeking to result in internalised change. Experience is also the process through which this work is created, the reflection on and within experience has allowed for a liberation of my own learning and contributed to tacit knowledge development. This has then been explored, adapted and applied to the new types of disruptive interventions with which I have designed and experimented. The experience generated through conceiving a project, be it in a Performative Presentation or Interactive Installation, allows for a series of operational modes to be identified, isolated and then applied in new situations. For example, the act of synthesis and translating complex ideas into narratives that make meaning for others, through the tactic of storytelling, builds upon itself through each experience of narrative translation.

Experience²³ of this sort has sought to respond to an ‘inner discomfort’ (Boud et al., 2013), the “(...) state of doubt, hesitation, perplexity, and mental difficulty, in which thinking originates” and which results in “(...) an act of searching, hunting, and inquiring, to find material that will resolve the doubt, settle and dispose of the perplexity” (Dewey (1933) in Boud et al., 2013, p. 12). Certainly, much of the practical modes of operation realised herein, evolved through a creative exploration of such

²³ Experience in design, is often referred to as ‘user experience’ or ‘experience design,’ drawing on ethnographic research to strengthen the experiences gained through interaction with a designed artefact/interface/experience. Whilst in part, this could be used to describe the approach taken herein the practice of curating experiences to evoke change, and in the case of this practice, this is done so through the lens of generating intrinsic social change outcomes.

a discomfort, with the ways in which design, as a productive practice, influences the world and the roles through which one can play out agency as an active agent of change.

3.5 EFFECTING CHANGE

Historically, there have been many schools of thought on how to effect change, with the *Theory of Planned Behaviour* (Ajzen, 1991) dominating the field for over three decades (Sniehotta, Presseau, & Araújo-Soares, 2014) and building on earlier behaviour change theories presented by Fishbein (1979), Lewin (1944), Lippitt, Watson, Westley, and Spalding (1958) and Prochaska and Prochaska (1999)²⁴. More recently, *Social Practice Theory* has been proposed by Giddens (1984) and Shove, Pantzar, and Watson (2012), adding to an array of literature on attitudes, social conditions, environmental influencers and behavioural economics (Darnton, 2008). The literature on 'change' is indeed vast and diverse and not surprisingly, distinctly lacks any consensus.

Kurt Lewin (1948) maintained that the status quo of a situation is upheld by structural forces that impact the individual, and that targeting the individual alone is fruitless in effecting change, due to the fact that individuals are more likely to be constrained by group pressure to conform. Durkheim defined this as a 'collective consciousness'—the binding forces that maintain social order. Yet social norms are constantly evolving and changing based on the actions and activities of participants (Ostrom, 2000). Discussed as 'systems of practice' and contributing to the development of Shove's Social Practice Theory (Shove et al., 2012), it constructs a perspective of change, based on structural forces informing actions, and agents exerting choices within those structures as to what systems of practice they will adopt and replicate (Whittington, 2010). It is through these choices that opportunities for challenging structural forces for pro-sustainability change can be sought. In her framing of Social Practice Theory, Elizabeth Shove makes the argument that in order to bring about pro-sustainability change, energies should be focused on transforming practices rather than individuals (Hargreaves, 2011). This perspective contextualises change in relation to constructed systems of action, thus encouraging change efforts to be interested in shifting 'collective conventions' (Shove & Warde, 2002; Watson & Shove, 2012).

Critical to the discourse though, is the notion of where agency lies. Social Practice Theory suggests that the agency for change lies within the influencers of social conditions (Hargreaves, 2011; Maniates, 2001; Shove, 2004; Shove et al., 2012). However, dominant historical theories of behaviour change present alternative views on agency and individual choice making. Ajzen's *Theory*

²⁴ For detailed reviews see: Darnton (2008), Kritsonis (2005), and Michie, Johnston, Francis, Hardeman, and Eccles (2008),

of *Planned Behaviour* and Fishbein's *Theory of Reasoned Action* provide models for predicting the intention to perform a behaviour based on an individual's attitudinal and normative beliefs (Southey, 2011).

Through explorations into these models, my own Theory of Change was developed, and a reflection on potential tactical ways of approaching a Disruptive Design Practice emerged. This led to experimentation with the adaptation of existing culturally constructed mechanisms of media and communication. While obviously not a new approach—activists, artists and actionists have been subverting and leveraging the power of the media for generations (Darts, 2004; Downing, 2001; Markussen, 2013; Rumbo, 2002), often referred to as 'cultural jamming'²⁵ (Farrar & Warner, 2008; Harold, 2004; Sandlin & Milam, 2008) this practice has sought to explore how to embody the act of effecting pro-sustainability change through the adaptation of and experimentation with these mediums.

Experience of objects and the physical world draws on frames, (the mental structures that shape the way one sees the world), that appeal to our ideas of what something is and what it should be (Levin, Gaeth, Evangelista, Albaum, & Schreiber, 2001). Georg Lakoff, an eminent proponent of frames, proposes that re-framing *is* social change, and that frames are the invisible scaffolding that structure thinking and actions (Lakoff, 2004). Thus, change requires dominant frames to be challenged through the act of *re-framing*. Making up a foundational component of one's worldview, frames are part of ones 'cognitive unconscious' and are constructed through communication—words, images, and phrases—all of which rely on the transfer of information (Chong & Druckman, 2007)²⁶.

The role of marketing's use in effecting social change has been covered extensively by Kotler (2011; 1969; 1991; 1989; 1971), which he defines as *social marketing* (Andreasen, 1995). It has been adopted in addressing public health campaigns (Donovan & Henley, 2003; Grier & Bryant, 2005) and advocated as a platform for addressing environmental issues (Kotler, 2011; Peattie & Peattie, 2009). Although, as Andreasen (2002) points out, the field faces significant barriers due to the lack of a clear understanding of its role in effecting social change. Nonetheless, the adoption of 'traditional' marketing and communication mechanisms in disseminating and enacting change

²⁵ Culture jamming are acts of subverting mainstream media, usually concerned with anti-consumption, attributed to the work of The Situationists. The *Adbusters* Magazine has documented countless acts with iconic examples including the subversion of the 1998 Absolute Vodka print ad campaign. The original ad featured a stylistically simple black and white image of the bottle with the tag 'Absolute Vodka'. The ad was redone to include the bottle sinking and wrinkled on one side a little and changed the bi-line to 'Absolute Impotence'.

²⁶ Studies have found that the framing of a message is critical to the effectiveness of uptake and engagement of pro-sustainability (Stewart Barr, Gilg, & Shaw, 2011; M. C. Nisbet, 2009; Owens & Driffill, 2008).

campaigns presents an array of opportunities for effecting change (P. Jones, Clarke-Hill, Comfort, & Hillier, 2008). For example, there have been many successes with community health campaigns for anti-smoking, AIDS prevention, skin cancer and exercise²⁷.

From these explorations into leveraging communication tactics, the *Game Changer Game* was developed to challenge dominant approaches to the ways in which social change campaigns are communicated. By targeting change makers and not-for-profits through game mechanisms it encourages a divergent approach to developing social and environmental communication campaigns. Like many projects undertaken by this practice, the idea was adopted and adapted to a variety of gamified mechanisms to encourage divergent thinking.

In Chapter 2, the approach taken in making change within this practice is discussed, drawing on a constructionist epistemology and adhering to the approaches in Giddens' theories, along with Shove, Watson, Hand and Ingram (2007), who present a more holistic view of the forces that effect change. They argue that incrementalised social change legitimises, rather than challenges unsustainable social conventions. Therefore, a progressive approach to, the intervening in, and shifting of collective social practices are explored herein. Given the social influencer role that design plays (Papanek, 1985), leveraging the design community to participate in shifting social norms through designed interventions is central to this practice's agenda. Rather than just considering the increase in consumer awareness on this issue, or direct behaviour change approaches, The Projects seek to affect the cultural conditions in which collective conventions and social practices emerge.

Looking at contemporary theories of social change, one finds the popularised version presented in the book *Switch* (Heath & Heath, 2010), which exploits a range of physiological, organisational and behavioural economics literature. The authors conclude that "ultimately, all change efforts boil down to the same mission: can you get people to start behaving in a new way?" (p.4). This is true in one respect, change at its fundamental level is about organising people to do what you want them to do and this is usually manifested in a shift in overt behaviours. Yet behaviours are only one indicator of change and this rudimentary view is in part why it is so difficult to bring about change (Shove et al., 2012). There is an old fable of the sun and the wind having a wager to see who could get a man to take his coat off. The wind blows harder and harder, yet the man just holds his coat closer and tighter to his body. When it is the sun's turn, it shines hot on the man until he happily removes his coat. Whilst this might be a metaphor on methods to effect change (the sun shines bright whilst the wind's method falls short), it is also a reminder of the expectations of change. The wind did

²⁷ A large body of academic work has documented social marketing in relation to these causes (Andreasen, 1995; S. Barr, Gilg, & Shaw, 2006; C. Bryant, 2010; Kotler & Roberto, 1989; Lee & Kotler, 2011)

actually change the man's behaviour *just not in the desired way*. It could be argued that the wind effected the most change in the man as his perceptions of his *need* for his coat and its protective capabilities, could have been cemented in new and profound ways.

Change does not simply manifest itself in observable actions, it is often the unseen and subtle shifts and changes that have the most influence and effect (Day & Monroe, 2000). Systems thinking proponent Peter Senge defines this rule of systems dynamics as cause and effect not being closely related in time and space (2006). Change is neither immediate nor obvious and it is often not possible to draw direct links between an intervention and a change outcome. Change takes time to sink in, to take hold and manifest itself. For example, an individual who engaged with the *E-Waste Autopsy Project* may not instantly decide to recycle their electronic waste, or even not appear to have any immediate effect on their thinking. It may be some time later that they hear about a council recycling service and decide to make the effort to take their unwanted goods there. A student who plays the *Design Play Cards* may not immediately understand or be interested in eco-design, yet their literacy and capacity to respond to such ideas and terms could have been increased through the experiential act of engaging, and may later inform their decision making process. These are the risks that the disruptive interventions take, not knowing what the exact change outcome will be, yet seeking to evolve interventions in ways that dynamically respond to the conditions within which they are operating.

Another contemporary approach to behaviour change is presented in *Nudge* by Sunstein and Thaler (2008), which constructs a libertarian based argument for using 'choice architecture' (p. 6) whereby people are encouraged through designed choice options to take up a preferred behaviour. Rather than removing an individual's freedom to choose, a 'nudge' towards a more preferable behaviour is constructed. An example of this would be, rather than removing sugary drinks from a shop, bottles of water are placed in more prominent locations thus nudging a preferred behaviour towards the water. These 'soft' change interventions (Johnson et al., 2012; Schlag, 2010) have been criticised for being paternal and providing a false sense of effecting change (Schlag, 2010; Vallgård, 2012). Indeed these simple interventions rely on economic rationalism of individual choice, assuming that the better option will result in better choice making, yet there is much discourse on the lack of rational choice making (Green & Shapiro, 1994; Loomes & Sugden, 1982; Ruiters et al., 2001; Tversky & Kahneman, 1986), and the nudge approach still allows for the undesirable option to be available. Certainly, from a sustainability perspective this just creates more 'stuff' and increases opportunities to engage in unsustainable choices. Given the vested interest of corporate marketing, it is a complicated way to battle unsustainable options.

Change, be it social, political or behavioural, requires actions to be effective in the everyday, for it is through going about day-to-day practices that interactions with other social agents occur. Life is played out in the everyday and thus we must now turn our attention to the role of everyday life in effecting pro-sustainability change.

Table 1: Overview of behaviour change theories

Theory	Core Elements
Lewin 3 step model of change (1947)	Lewin's theory suggests that there is a 3 step process to changing an individual's behaviour within an organisation: 1. Unfreeze – prepare the organisation/individual to accept that change is needed by breaking down the current status quo 2. Change – through resolving uncertainty and seeing personal benefits people start to engage with the change (time and communication are critical to this being successful) 3. Freeze – when change has happened then refreezing sets the new behaviours as 'norms'. It has been criticised as being only relevant to small-scale changes and only in stable conditions. Also, for ignoring issues such as organisational politics and conflict.
Ajzen & Fishbein Theory of Reasoned Action (TRA) (1969)	A model for predicting behaviour intent based on attitudes and normative social influences such as external forces. Presents 3 key constructs for analysis in behaviour change: behavioural intention, attitude, and subjective norm.
Ajzen & Fishbein Theory of Planned Behaviour (TPB) (1991)	Building on TRA, Ajzen & Fishbein adjust the model to include that perceived control over the outcome of behaviour is rationally based. Behaviour is explained by intentions that are influenced by attitudes, subjective norms and perceived behavioural control (Lepri et al, 2012, pp. 254). Cognitive self-regulation, attitude, intentions related to attitude, what other people think, subjective norms, perceived level of control over the behaviour and self-identity are all influencing factors in effective behaviour change.
Bandura Social Cognitive Theory (1986)	Bandura determines that people are self-reflective and self-organising and learning occurs in a social context influenced by interactions, environment and behaviour. Social conditions affect behaviours.
Giddens Structuration Theory (2005)	Giddens suggests that social structure and human agency are entwined in a relationship, and that it's through the repetition of the acts of individual agents that reproduces the structure. Structuration Theory also proposes that structures such as traditions, institutions, moral codes, and established ways of doing things can be changed when people start to ignore, replace or reproduce them differently.
Giddens, Shove et al Social Practice Theory (2011)	Social practice, norms and structures rather than the individuals are what effects change. It perceives individuals as agents who actively perform practices in the course of everyday life, which creates collective conventions. Change then is interested in shifting practices rather than behaviours (Hargraves 2011).
Behavioural Research Unit The Stages of Behaviour Change model (2006)	Suggests that there is a six step process that people go through when integrating new behaviours: 1. Pre-contemplative/unaware 2. Contemplative 3. Preparing 4. Action/trying 5. Maintaining 6. Termination/advocacy/transcendence
Giller et al Behavioural Intervention (2012)	Behavioural intervention is most effective when systematically planned, implemented and evaluated, and the guidelines for designing successful interventions have been generated for their context of pro-environmental behaviour. Select a Target Behaviour – diagnose the problem Identify Behavioural Antecedents – psychological (e.g. attitudes, barriers, values and goals) and contextual factors (e.g. Technological, economic, demographic, institutional, cultural) should be considered Choose an Intervention Strategy – financial and structural strategies seem to be more effective for changing high cost behaviours with greater long-term impact Evaluate – ability to influence target behaviour and select behavioural determinants

3.6 SOCIAL NORMS AND EVERYDAY LIFE

Social Practice Theory posits that agents navigate and perform practices throughout their everyday lives, which in turn evidences the need for interventions into everyday experiences in order to effect social change. Many scholars have addressed the topic of everyday life and the role in which the individual and system structures interact to form experiences of existence (de Certeau 1998; Fisk 1992; Norman 2002; Shove et al 2009, 2012). Berger and Luckmann (1992) explore the role of language in objectifying and categorising the experiences of everyday life. They say:

“I live in a place that is geographically designated; I employ tools, from can openers to sports cars, which are designated in the technological vocabulary of my society; I live with a web of human relationships, from my chess club to the United States of America, which are also ordered by means of vocabulary. In this manner language marks the co-ordinates of my life in society and fills that life with meaningful objects” (p. 22).

This presents how the meaningfulness of everyday life is imposed by the structures that are created, performed and re-performed by social agents (Giddens, 1984; Shove et al., 2007). It is through the construction of meaning that everyday behaviours are born and cemented, and thereby allows the possibility of change interventions in their flow. Just as habit, routine and repetition are, according to Levi-Strauss, a course of meaning and value (Levi-Strauss, 1962), changing behaviours requires a re-evaluation of meaning. This is made more complex by the occurrence of cognitive dissonance.

As we go through our lives, we operate within zones of experience that allow for a perpetuation of social practices and norms. We do also encounter ‘problematics’ (de Certeau, 1998) when we have to operate outside these zones: for example, when we are asked to engage with something not within our everyday repertoire—perhaps a baker who is an expert at making bread is required to create a wedding cake—a schism in experience of the everyday requires the agent to internalise a new set of practices into their everyday (Berger & Luckmann, 1992). This disruption to the habitual nature of the everyday is where scope for intervention exists. The acquisition of new knowledge allows for designed disruptions in the forms of educative experiences that fill the required gaps in knowledge.

The same can be said of any profession, such as a designer or educator who, when presented with the task of engaging with a new subject such as social and environmental concerns, experiences the problematic situation of this task falling outside their immediate skill set and therefore requiring a

new set of skills to be adopted to overcome the schism. This issue of 'knowledge gaps'²⁸ is one this practice seeks to bridge through the creation of educational propositions such as the *Secret Life of Things* (2010-2014), the *Design Play Cards* and the *Good Design Guide*. These projects have been developed to assist with these problematics experienced in the enactment of sustainability into curriculums and the everyday. By incorporating content related to existing curriculum requirements and providing a variety of resources designed to be used in-class with teacher cheat-sheets, these interventions seek to be a desirable addition to the everyday practice of design education.

For example, in 2011 the *Victorian Curriculum and Assessment Authority* (VCAA, 2011) released the new *Design and Technology Study Guide* for high school educators which included the requirements of teaching sustainability in design (and providing a comprehension of life cycle assessment, eco-design strategies and extended producer responsibility). This significant addition to the curriculum requirements for Victorian design and technology teachers was in part a motivator for the development of the second *Secret Life of Things* animation, and the *Design Play Cards*, and in developing these projects, the community of educators they were seeking to assist were collaboratively consulted during the development process.

Another intriguing and useful area of study with which this practice is concerned, is performance and the repetition of individual tasks and roles in everyday life. Each of us performs tasks professionally and personally, and through the repetitions that make up our lives we actively (albeit, for the most part unknowingly) participate in the creation of collective conventions. Since so much of what is considered to be un-sustainable is linked to the practices of our everyday lives (Shove, 2004; Shove et al., 2007), seeking to effect change must challenge the dominant underlying performance of everyday practices. I seek to do these through a variety of methods, from embodying the role of change-agent in Performative Presentations to the re-framing of narratives and the creation of analog games—all of these experiments seek to disrupt the practice of everyday actions and discourse.

The defined Tactics of challenging, storytelling and playing (as outlined in Chapter 5) are employed as methods for practicing the agency-of-change. The objective is to challenge the mental constructs of what constitutes being 'sustainable', and thereby challenge the myths that exist and encourage this knowledge to permeate the everyday practices of individuals and their social/cultural systems.

²⁸ Knowledge gap theory posits that there is a 'sweet spot' for engaging people with seeking out new information (Courtenay-Hall & Rogers, 2002; Hornik, 1988; Loewenstein & Lerner, 2003). Heath and Heath (2010) relate it to the fable of Goldilocks – if you make someone aware of a gap in their knowledge that is too big they will avoid it, too small and they ignore it, but just the right size and they will actively seek out new knowledge to fill the gap.

This has formed as a practice of mythbusting, seeking to disrupt dominant thought patterns in both the mind of the performer and the participants. This interplay evolves in unpredictable ways, just as the rules and play of a game allow for multiple end points; employing Tactics in a disruptive practice will not guarantee any particular outcome.

In daily life, one performs a series of habits. Duhigg (2012) looks at the science of habit formation and change, referring to what he calls the 'habit loop', whereby behaviours are reinforced through repetitive action to create routines. In order to break a habit one has to rewrite the code that created it. Habitual actions have been studied as part of social cognitive theories of behaviour change, seeking to understand why people do or do not adopt a new behaviour (Nilsen, Roback, Broström, & Ellström, 2012). The authors of a report entitled *Creatures of Habit* (Prendergrast, Foley, Menne, & Isaac, 2008, p. 6) state that "in going about their daily lives, people are guided by impulse, habit and social norms as much as by the availability of information and a desire to minimise cost" thus concluding that the traditional rational choice model of behaviour is an ineffective approach to address complex social problems. The cracks that exist in the dominant social/behavioural theories open up space for subversive and tactical ways of encouraging, facilitating and potentially normalising change activities within the everyday through the identification and intervention into systems, which will be outlined in the following chapter.

3.7 LEVERAGING AND INTERVENING IN SYSTEMS

The notion of interventions being used to generate change outcomes is bedrock to the systems thinker as discussed by Ackoff (1994) and Meadows (1999); through identifying and analysing a system for possible points of intervention, one can then design a change-focused disruptive intervention. Yet there are unpredictable and unintended consequences that can come about through the interconnectedness of everything and the ripple effects of change²⁹. Systems thinking as an approach, seeks to reduce negative rebound effects through the understanding of systems dynamics, such as through the identification of feedback loops in system componentry. In order for these types of analyses to be viable, one must draw a system boundary and scope in order to clearly define the arena in which one is operating. The latter is a technique used in life cycle assessment, and within

²⁹ Several of these unintended consequence examples are detailed in my TEDx Melbourne talk. One such example is that of the European Union and the USA introducing biofuel policies that mandated a small percentage of biofuel to be incorporated into petrol. The change in land use and economic incentives to farmers has since been linked to a world food crisis (Findlater & Kandlikar, 2011; Harrison et al., 2010; Hertel, Tyner, & Birur, 2010; Oezdemir, Haerdlein, & Eltrop, 2009; Prins et al., 2011).

this practice these approaches have been adopted as part of the method for designing interventions within what has become a Disruptive Design Process (this is described in detail in section 5.3).

Systems thinking requires the identification of individual interconnected components or agents that make up the larger collective whole. This requires meta and macro level thinking—which I describe as the periscopic and microscopic views—and enhances the ability to identify links and relationships between seemingly independent items. This approach has afforded this practice an ability to dissect complex information systems down into ‘nuggets’ of transferable content that can be moved and restructured to build narratives that collectively make up a bigger picture. These nuggets of information are often presented in cards (or parts of a game), scenes in animations or pages of an app or book. This ‘breaking down’ to build up is foundational to the practice’s methods and has also aided the reflective process of practice development. This ‘nuggeted’ approach to information arrangement was used in the *Design Play Cards*, *The Good Design Guide* and throughout the *Performative Presentations*.

3.8 COMMUNICATION AND HUMAN PERSUASION

Communications cover a broad and disconnected arena of theory (Entman, 1993). Although, here the focus is on the role of communication techniques in cultural manipulation and persuasion through agenda-setting (McCombs, 2013; McCombs, Shaw, & Weaver, 1997). This generally covers mass media, advertising and modes of communicating (J. Bryant & Oliver, 2008) relevant to influencing human desires, such as Lakoff’s framing. The ways in which messages are framed and transmitted affects the salience and receiveability of an argument (Chaiken & Eagly, 1983; Entman, 1993) and therefore, much of the agenda of this body of work is to find new narratives through the re-framing of discourses and ideas such as sustainability and disruption, so that they can be utilised and leveraged within a change-making praxis.

Indeed, marketing and advertising has for years participated in the manipulation and subtle leveraging of individual desires to increase an ‘ideology of consumption’ (Blackburn, 1992). The persuasion of consumers through advertising in the post-war era “(...)encouraged the belief that by the ‘conspicuous consumption’ (Veblen, 1899) of products the individual could achieve the ‘good life’” (Blackburn, 1992, p. 60). As an agent of persuasion (Klapper, 1960), mass communication from the media to marketing, has been built on the manipulation of desires (Dichter, 2002). Baudrillard (1996) calls advertising the ‘praxis of consumption’, with its ability to manipulate motivations, giving it a social imperative to act responsibly.

These approaches have been employed over generations, allowing for the moulding of consumer-centric societies through indoctrination and intoxicating messages (Bernays, 1947). I argue that by poaching from these tactics, hybridising, adapting and converting them to counter-incept traditional messaging about how and what sustainability is, one can create a conceptual tipping point (Gladwell, 2006), whereby sustainability and its subsets are sold with the same desirability and persuasion as any mass produced good or political propaganda. Part of the sustainability agenda is to reorient priorities towards service rather than commodity based economies, where greater value is placed on experiences than on material wealth. In order to obtain this transition, there needs to be a significant shift in normalised values and behaviours in the everyday, and thus, requires messages that are desirable, achievable and amplifiable. To this end, The Projects experiment with positive re-framing of messages regarding social and environmental issues and the use of challenge as a mode of implicating the audience.

Whilst there is no consensus on which framing approach (negative or positive) has the greater persuasive effect (Maheswaran & Meyers-Levy, 1990), studies (Petty & Cacioppo, 1986; S. Smith & Petty, 1996) suggest the importance of positively-framed messages (Entman, 1993), especially when there is a lack of pre-existing issue involvement (Maheswaran & Meyers-Levy, 1990)³⁰. Thus, within this practice message framing is approached from a positive, solutions and action-oriented position. I seek to emancipate viewers from the binds of negativity and encourage participation in the construction of new meanings associated with social and environmental considerations in design and consumption through the re-framing of dominant discourse, subtly embedded within gamified experiences and transferable tools such as the Education Tools.

There is much cross over between play and communication as discussed by Stephenson (1988) “(...) social control nor convergent selectivity can be understood without attending to the play they enjoy. We are therefore to consider a play theory and not an information theory of mass communication” (p. 3). To this end, the words of Anthony Judge are echoed here, where both humour and play are taken ‘seriously’, as they transcend the boundaries that constrain change processes in religion, government, and transdisciplinarity (Judge, 2005).

Modern technology is increasing the ways in which messages can be disseminated, where dominant social conventions and opinions are altered—such as the rise of mobile device usage—which has created another form of direct access (Consolvo, Markle, Patrick, & Chanasyk, 2009). The use of gamification as an experiential communication tool was tested through the development of the

³⁰ Although, some studies have found that cultural conditions affect the level of effect (Levin et al., 2001)

Mythbusting App—exploring opportunities to gain access and educate through play in a mass communication mechanism.

These contemporary communication platforms require new ways of articulating. Wittgenstein discusses this reappropriation of ideas, as “an old style can be translated, as it were into a newer language; it can, one might say, be performed afresh at a tempo appropriate to our own times” (Wittgenstein, 1984, p. 60). In the *Mythbusting App*, the ideas are performed through the act of play; the information is static but the user plays out the act of committing to an answer. The right or wrong answer acts as a reward or disappointment and the ideas are reinterpreted into new forms of experiential communication. Many of the other Interactive Installations and Educational Tools experimented with here, purposely employ play as a mechanism for engagement and thereby activate this through modern communicative means (such as applications, online multimedia, books etc.). The latter is concerned with the ways in which messages can be made adaptable and amplifiable, as the next chapter will now discuss.

3.9 ADAPTATION AND AMPLIFICATION

Throughout this body of work, there have been intentional experimentation with, and incorporation of, an array of devices such as shareability, mediagenics, fun, humour and challenge – all of which are intended to encourage a level of amplification through the delivery of the Project-based interventions. Encouraging copying and freedom of use such as through Creative Commons licensing (Boyle, Lessig, & Abelson, 2001), it is intended to encourage adaptation, amplification and a culture of sharing (Lessig, 2004a, 2004b), thus assisting with the goal of intervening and leveraging change through small disruptive acts. Manzini and Rizzo (2011) discuss these emerging approaches as being aimed at effecting large-scale pro-sustainability change through planned, “small-scale, short-term projects”, “synergised and amplified” through larger initiatives (p. 200) and as discussed previously, these principles are foundational to systems thinking.

Amplification lends itself to the analogy of a small stone being thrown into a still river; the ripples that radiate from its force are the amplification that emerges from the interventionist act. Richard Dawkins (1976) in his now famous book *The Selfish Gene* related the concept of a meme to the self-fulfilling determinants of a virus, amplification seeking to echo intentions out into the world through the devices employed. The tactic of storytelling is one such device employed to achieve this.

An example of this process of amplification can be shown by examining three of the interactive projects undertaken through this practice; *The Repair Workshops* (2011), *E-waste Autopsy* (2014) and *The Design Play Days* (2014), all small-scale, short-term projects constructed and delivered to

generate media coverage, conversations, shareable online videos etc. and serve as propositions with lives beyond their initial worldly intervention. Each project was designed to incorporate varying degrees of mediagenic potential, seeking to offer avenues of repetition and adaptation through the information conveyed within the project.

The *Repair Workshops* leveraged mainstream media to generate conversations about why products are designed to break, and proposed repair as a viable and fun alternative to waste. Several radio interviews (ABC radio, Triple R and PBS), newspaper and online stories (Blackwood, 2011a, 2011b; Griffin, 2011; Lyon, 2011; State of Green, 2011), live blogging (Acaroglu, Brendle, & Grace, 2011), social media, stakeholder involvement along with strategic media relationships, resulted in a considerable amount of generated conversational content that lived beyond its initial intervention. A mini documentary published by Design Quarterly (Blackwood, 2011b; Kappel, 2011) and post project coverage in the design media (Blackwood, 2011a) allowed for ongoing provocations and adaptation by others. This project was itself was an adaptation of Platform 21's *Repair Projects* (Platform21, 2009) from the Netherlands, a propositional intervention that was simply amplified through the involvement of others to adapt and expand the idea of repair.

The Design Play Days at the National Gallery of Victoria (NGV) tactically leveraged the power of a large cultural institution to propose active, game-based educational experiences in teaching design and sustainability. The gamified explorations proposed through this project were adapted by the in-house educators and amplified through their educational platforms. Coverage in the Gallery's Magazine (Hannah, 2014), online (Horvat, 2014) and in teacher training sessions run at the NGV, allowed for more potential amplified outcomes. The *E-waste Autopsy*, which also took place at the NGV, saw the entire 4-hour project being documented visually resulting in the production of a mini video highlighting the proposition and issues of e-waste. This resulted in a request to conduct a version of the project in Queensland by another cultural organisation.

3.10 CHAPTER 3 - CONCLUSION

This chapter has explored and contextualised the academic arenas from which this practice operates and draws. The concepts presented herein are central to the approaches taken in developing and articulating a Disruptive Design Practice and in answering the research question of how one can develop a practice that is empowered to enact an agenda to effect pro-sustainability change.

The theoretical constructs of experience, change, design methods, social norms, the everyday, communications, adaptation, and design processes are central to the underpinning and formation of the change-centric agenda. It is through engagement with, and exploration of these fields, that I

have empowered and distilled this practice and within the reflective action research cycle have returned to these approaches whilst evolving and developing The Projects discussed in the following chapter.

For example, the understanding of and experimentation with transdisciplinarity has facilitated a way of practicing that delves in and through a variety of disciplines, design, sociology, and environmental sciences, forging a new type of practice. As Fry frames, a redirective practice that has formulated disruptive interventions in the form of 'projects', The Performative Presentations are examples of this in practice, by utilising the stage as a platform, I can directly propose divergent ways of approaching sustainability. Knowledge of the diversity of theories around effecting change have encouraged the development of projects such as the *Game Changer Gamer*, and the Interactive Initialisations to be developed, with particular attention to the ways in which individuals can be implicated in the act of challenging collective conventions and formulating alternative pro-sustainability ways of doing.

Communication theories, specifically the role of framing and social marketing have allowed for testing of divergent frames and approaches to communicating sustainability, such as those presented through the *Secret Life of Things* animations and the *Good Design Guide*. These projects have enabled a building upon and an adaptation of what has come before through the reinterpretation of content into the *Design Play Cards* and *Design Play Days* (this process is described in detail in Section 5.3). This notion of amplification and adaptation has facilitated projects taking on new approaches to existing interventions (such as *The Repair Workshops*) and sought to generate amplifiable propositions. In the following chapter, these projects are outlined in more detail, paying specific attention to the modes of operating in which they employ the framing of the interventions in relation to achieving the research goals.

Project Images

Educational Tools

The Secret Life of Things

The Design Play Cards

The Good Design Guide

Interactive Installations

The Repair Workshops

E-waste Autopsy

Design Play Days

Performative Presentations

AIGA Talk

TED talk

Games

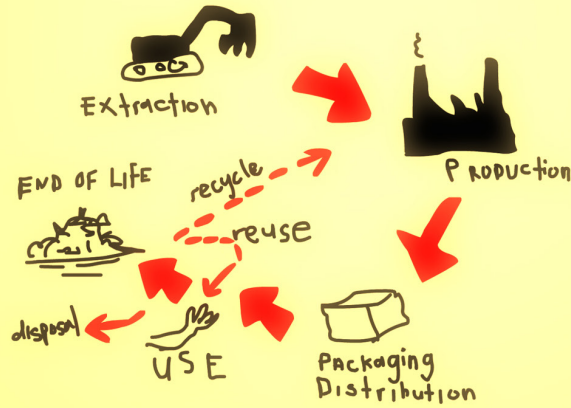
Game Changer Game

Mythbusting Sustainability App

THE SECRET LIFE OF THINGS #1

LIFE PSCYCLE-OLGY 2010

LIFE CYCLES AND PSYCHOLOGICAL HEALTH



THIS IS YOUR LIFE CYCLE

ANGELINA

RA-RA

GOODFREY

SUK

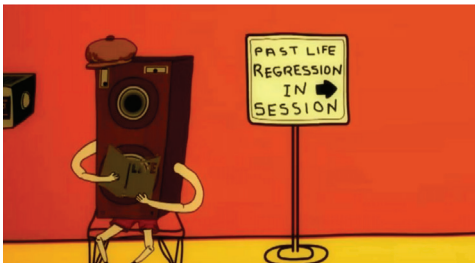
KN

VO

THE SECRET LIFE OF THINGS #2

THIS IS YOUR LIFE CYCLE 2012

ANIMATIONS: NICK KALLINCOS



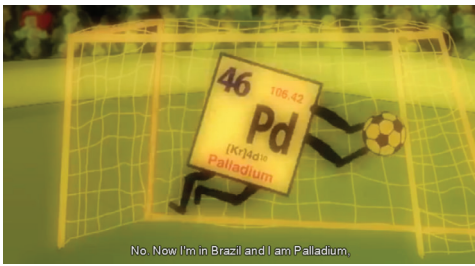
PAST LIFE
REGRESSION
IN
SESSION



I need a new direction, there has to be more to life than being stuck in a drawer?



I'm in all these little bits, I think I'm metal...
...metal ore



No. Now I'm in Brazil and I am Palladium.



And then, Ow no no no I'm in Australia and I'm in the desert and I'm Nickel



Mummy, mummy is that you?



So you got addicted to use. Then what happened to you Eric?



there is still hope for you yet



Eric, Eric Sun



We will dial up your past lives, then we can see what you are made of



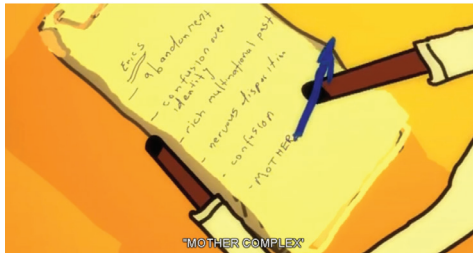
I'm in all these little bits, I think I'm metal...
...metal ore



Ow ow I'm suddenly really cold, and I can't understand what they are saying but I think I'm Platinum and I'm in Russia,



If we go through all of your metals we will be here all day



"MOTHER COMPLEX"



It's my first birthday and things aren't going so well.



Now Eric it would have been much easier if your parents had thought about your life options when they created you



Hmm, Ok now what seems to be the problem?



Past life regression operator, connecting you call now



No, I'm in South Africa in a gold mine.



Wait, wait I'm silver in Mexico now and I'm Silver



I'm feeling a little bit sick



ow I feel so alive and I can hear all these voices



that's when she came along she was so shiny, so new



where you will be disassembled and transformed into many new products Eric

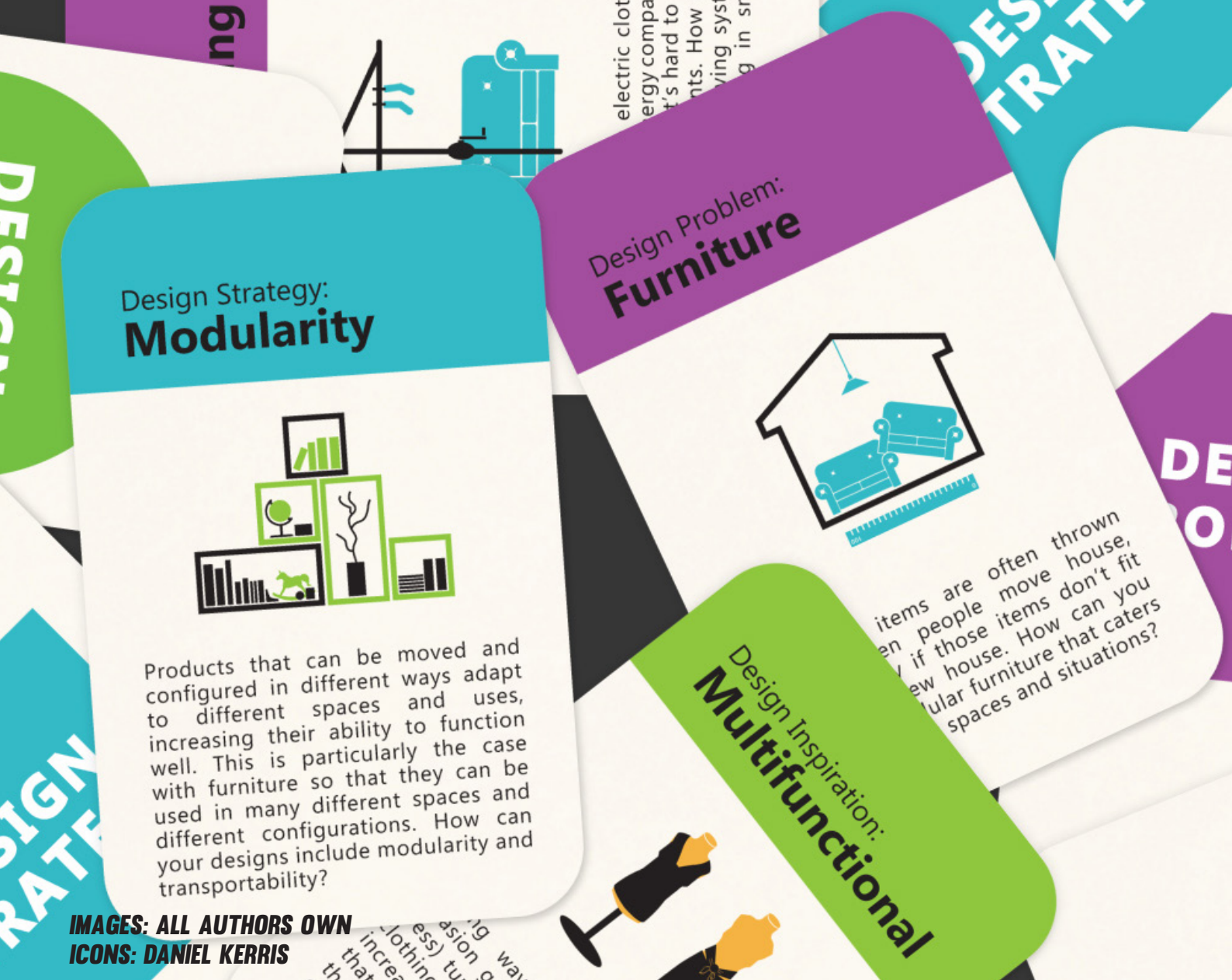
ANIMATION: NICK KALLINCOS

THE SECRET LIFE OF THINGS #3

IT'S THE LITTLE THINGS 2014



**THE
DESIGN
PLAY
CARDS
2012**



**Design Strategy:
Modularity**



Products that can be moved and configured in different ways adapt to different spaces and uses, increasing their ability to function well. This is particularly the case with furniture so that they can be used in many different spaces and different configurations. How can your designs include modularity and transportability?

**Design Problem:
Furniture**



Items are often thrown away when people move house, especially if those items don't fit a new house. How can you design modular furniture that caters to different spaces and situations?

**Design Inspiration:
Multifunctional**



**IMAGES: ALL AUTHORS OWN
ICONS: DANIEL KERRIS**

GOOD DESIGN GUIDE

2014

DISCOVER SUSTAINABILITY THROUGH DESIGN
WRITTEN BY LEYLA ACAROGLU



Whole Systems thinking

Map the life across all its life cycle stages

Reduce and replace the negative impacts, enhance the positive aspects of the product

PACKAGING

ALL MATERIALS COME FROM DERIVATIVES

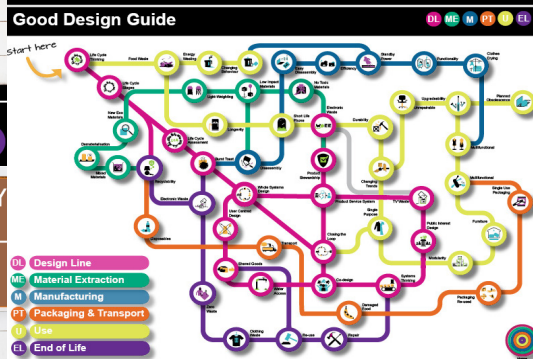
You can't make something out of nothing

Good Design Guide

DL ME M PT U EL

DISCOVER SUSTAINABILITY THROUGH DESIGN

WRITTEN BY LEYLA ACAROGLU



E-WASTE AROUND THE WORLD

Every year 20 to 50 million tonnes of e-waste is generated globally, with Australia having over 17 million computers, televisions and other e-waste items thrown away each year. Only about 4-10% of e-waste is actually recycled. To date, roughly 37 million computers, 56 million mobile phones and over 17 million TVs have gone to landfill in Australia.

No Toxic Materials

Why does it matter?

TRY IT YOURSELF!

You are commissioned to design a trade fair display stand for a company that is frequently promoting their products at exhibitions. Each trade show has a different sized space and the display stands need to be easily transportable around the country.

Their product fits in a 50x50cm box so the display stand needs to effectively display these products.

The display stand that you design must be upgradable, modular and durable so that your client can reuse it, re-configure it and add to it as they need to. The product should also be lightweight and flat packable for easy transportation.

Not Upgradeable

Multifunctional?

REPAIR

Repair: verb, restore something damaged to good condition

Find out how to fix stuff on ifixit.com

Systems Thinking

It's not that long ago that you would have been able to take a broken item to a repair shop, but these days they are pretty hard to find. It's become more common for cheap items to be designed to break and we all just accept that things are more disposable, so we throw them in the garbage and get a new one! But many products (especially high value electronics) can be repaired.

Use

We all use products, in fact our lives are filled with designed things! It's during the Use phase that things often fail. Bits break off, people misunderstand the intended purpose, and general wear and tear, all result in Use phase failures (which then results in further waste). Through good design these types of issues can be better planned for and avoided through strategic decision making, ethnographic research and functionality analysis. Many big environmental impacts occur through the Use phase and there are many different design solutions to create better goods and services.

Energy Wasting?

End of Life

Everything ends up at an end of life point when it is no longer needed, breaks, or was designed to fail. There are several end of life options, from reuse, recycling, reselling, remanufacturing, to incineration, landfill, and the worst one of all — litter. The way a product is designed helps determine what will happen to it at the end of its life — and the thing we want to avoid is waste.

The by-product of production is waste. Unless we create systems that are specifically closed loop, and design products that are recyclable within these systems — we generate waste. In many cases, wasted products end up in landfill which means all their value is lost from the system and new resources have to be extracted to replace them.

Recyclability

RECYCLABILITY

Recycle: verb, convert waste into reusable materials

Making a recyclable product goes beyond simply selecting a material. You must consider the recyclability of all of a product's materials, and ensure that they can be disassembled easily for recycling at end of life.

Another important consideration is whether you have systems in place whereby the product can be returned to its manufacturer and recycled at end of life.

Life Cycle Thinking

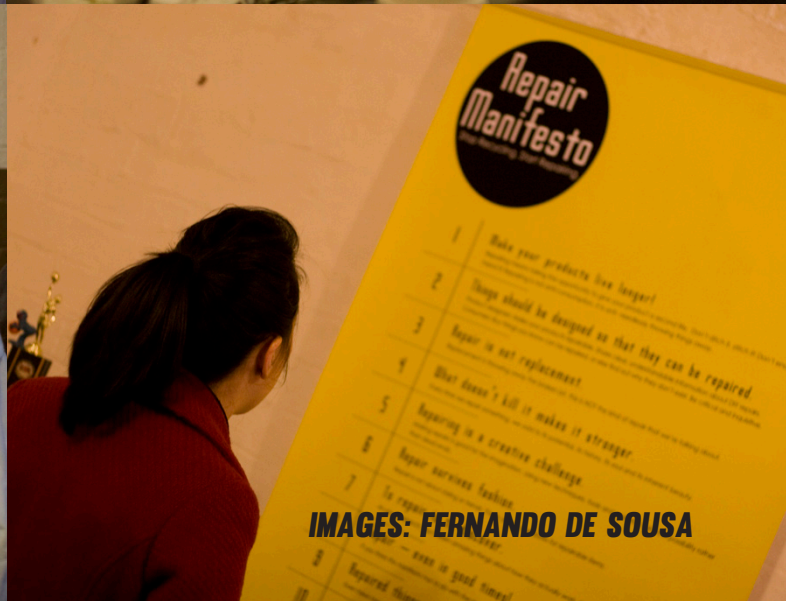
Electronic Waste?

PACKAGING RE-USED

Packaging is often thrown out right after the product is purchased. How can you design a multifunctional packaging item so that it can be made into something else? A jam jar can turn into a water glass, a shoe 'box' can be its own carry bag, and a laptop box could become a computer stand.

Low Impact Materials

THE REPAIR WORKSHOPS 2011



IMAGES: FERNANDO DE SOUSA

DESIGN PLAY DAYS 2013/2014



STUDENTS AT THE DESIGN PLAY DAYS
IMAGE: AUTHORITY

GALLERY MAGAZINE

YOUNG AT ART

57



Left and below right: Students test their design skills in the 'bridge challenge' during the Access Melbourne Now Schools Access Program. Photos: Selina Ou

It's a brisk 4 am and the Year 7s and 8s from Tyrell Secondary are chatting in the early morning darkness as they stride onto the bus that will take them to Melbourne from the small rural town of Sea Lake in the Mallee.

A big day lies ahead: first up, a four and a half hours bus ride for these farming kids, some of whom have never ventured to the city. As they lark about with their classmates in the confines of the bus, what do they imagine will be at the end of that long and tedious ride?

Perhaps they are simply glad to have a break from the routine of the school day. Their destination, 351 km away, is the National Gallery of Victoria – a far cry from their tight-knit rural town that prides itself as the heart of Victoria's vast cereal-growing foodbowl and the home of the famed Mallee Rajji. Held each year on the Queen's Birthday long weekend, the rally speeds around Lake Tyrell, an ancient salt lake with a sea-like appearance, after which the town is named.

While logic suggests that visiting a public institution such as the NGV should not be a privileged experience, the reality sometimes proves otherwise. Students from Tyrell Secondary, or from areas of economic and social disadvantage may find it hard or even intimidating to visit a big city gallery, it may not be within their sphere of experi-

ence; they may not feel they belong, or even know that the NGV is free and open to all Victorians.

But a new schools program that was launched to coincide with the NGV's Melbourne Now summer exhibition aims to rectify this and help students from low socio-economic status schools and from regional areas to visit the Gallery and gain the recognised educational benefits of engaging with the arts.

Funded by the philanthropists Harold and Krystyna Campbell-Pretty, the Schools Access Program is the first of its kind and, from December to March, enabled 1000 students to visit the NGV to take part in free activities exploring contemporary art, design and critical and creative thinking using the Melbourne Now exhibition as prompt, stimulus and inspiration. Aimed at the gamut of primary, secondary, government, non-government, metropolitan and regional schools, the program covered travel costs and catering for the students, as well as a souvenir publication.

The Schools Access program provides opportunities for students who otherwise might never visit the NGV, and, in doing so, of course we hope they come back,' says NGV Senior Educator Michele Stockley.

Giving students access to the arts has risen steeply up the list of the NGV's priorities. This reflects a growing global recognition that art education has a critical

'The Schools Access program provides opportunities for students who otherwise might never visit the NGV, and, in doing so, of course we hope they come back.'

Michele Stockley

role to play in the creative and cognitive development of twenty-first century students. Today's students face an increasingly complex world in which rapid technological change continues to transform their understanding and experience of communication. Visual literacy is a crucial skill in this new world, and art can help students in this area, giving them the ability to decode and analyse meaning in the various forms of media they will encounter.

After their monotonously long (nausea-inducing for some) bus ride, the Tyrell Secondary students finally arrive at the bluestone facade of NGV International and are invited into Federation Court for their opening encounter with contemporary art: Rory Hyde's igloo-like Bin dome, 2013, made entirely from plastic IKEA bins filled with living succulents. The ingenuity of Hyde's design and his inventive use of everyday materials begin to give students a taste of the sort of skills they will need for the activities to come. But first, a tour of the Melbourne Now exhibition, during which the students learn more about artists' innovative use of materials and the ever-changing boundaries of what art can be. Later, some will remark on their feedback forms: 'I learnt today that art can be made out of anything', and, 'There is more to art than I thought'. Already, their minds are being opened to new possibilities.

With this broadened view of creativity, the students return to the Great Hall ready to compete in a design challenge that will test their own resourcefulness and imaginations. The students are divided into groups and set three challenges, each to be completed within twenty minutes: a bridge challenge, a T-shirt challenge and a waste challenge. The challenge ringleader is award-winning designer Leyla Acaroglu, founder of Eco Innovators, a creative agency with a focus on sustainable design whose work is featured in Melbourne Now. Acaroglu is a dynamo and the students cannot fall but fail for her energy and enthusiasm.

'This is what you will be doing today,' she says, explaining each challenge to the students. The bridge challenge requires the students to construct a bridge from toothpicks and lollies; the T-shirt challenge, to map the life of a T-shirt from cradle to grave; the waste challenge, to design and build a self-propelled vehicle using recycled materials. Sensing the rising anxiety (they are not called 'challenges' for nothing) Acaroglu produces the carrot. And, for the winning team, we have a very special design challenge trophy,' she says, holding up a large, multi-tiered, Picasso-inspired recycled foam sculpture.

The clock starts and the students attempting the bridge challenge hurriedly brainstorm designs and experiment with the materials. Toothpicks are squeezed into the

soft jube lollies and a wild assortment of shapes materialise. Twenty minutes feel like two and the constructions must now be tested for their strength and engineering prowess – will they work? Each bridge is laid across two stools and a pile of books is placed on the constructions. A suspenseful hush fills the room: some of the bridges absorb the weight, provoking sighs of relief. But when one of the bridges collapses the room erupts into a roar.

As the groups of students rotate through the three challenges they are required to experiment, be bold and think creatively about design, purpose and unintended consequences. In completing the tasks, the students are developing the sorts of skills that New York Times columnist Thomas L. Friedman describes as necessary to produce the next iPod revolution or successor to Google. In his book *The World is Flat: A Brief History of the Twenty-first Century*, 2005, Friedman suggests aesthetics and creativity are just as important as technical knowledge in the new economy. The secret sauce comes from our ability to integrate art, music, and literature with the hard science.

The importance of the arts in education is also noted by the University of Sydney's Professor of Teacher Education, Robyn Ewing in her Australian Education Review essay *The Arts and Australian Education: Realising potential*, (2011). She writes: 'It is



**E-WASTE
AUTOPSY
2014**



BOTH IMAGES: LINTON WOOD

**AIGA
TALK
2013**

**TOP IMAGE: JAY LARSON FOR AIGA
BOTTOM IMAGE: JAMES DUNCAN DAVIDSON FOR TED**



TED

**TED
TALK
2013**

GAME CHANGER GAME 2014



ROUND 1 1 / 3 SCORE 0

What happens to organic matter when it goes into a normal landfill site?

Just sits there doing nothing

Biodegrades into soil

Rots and creates methane

ROUND 1 1 / 3 SCORE 0

You are incorrect.

You selected: Biodegrades into soil

Correct answer: Rots and creates methane

A 'landfill' is an anaerobic (oxygen-free) environment where methane is produced as the waste decomposes. Unless there is a capture facility, the methane – which is a potent greenhouse gas – escapes into the atmosphere, contributing to climate change.

Congratulations!

Your score was:

140

Did you get the score of 1500? No you are an Innovator! Do not try again!

ROUND 2 3.3 SCORE 210

MYTHBUSTING SUSTAINABILITY APP 2011

4. THE PROJECTS

4.1 CHAPTER 4 - INTRODUCTION

The Projects explored throughout this body of work are divided into four areas of exploration: Educational Tools, Interactive Installations, Performative Presentations, and Games. An overview and examination of each project is provided in this chapter, building on the sociological foundations and research context discussed in the previous chapters. Further to this, there is a personalised narrative woven throughout, detailing the act of evolving and amplifying the work in relation to the Theory of Change, outlined in Section 2.4.

These Projects are intentionally disruptive interventions and in small ways, they interrupt and shift the status quo; being informed and motivated through these aforementioned theoretical positions, specifically with regard to the social and psychological foundations of constructed society. Within this, experimentation with tactical ways of operating, evolved approaches and ideas that use new theories and experiences. In so doing, I have sought to develop and construct a divergent process of enacting a pro-sustainability practice. I will now detail The Projects developed and performed within the scope of this practice.

4.2 EDUCATIONAL TOOLS

Arguably, one of the most significant contributors to educational theory is John Dewey, the proponent of experimental, experience-based learning. In calling for a 'philosophy of educative experience', he clarifies that not all experiences are educative (Dewey 2007), but that education needs to be gained through experience rather than instruction. Immanuel Kant used reason to establish metaphysical truths of how we acquire knowledge of the world. The human mind is an active, not passive recipient of information. It is in the mind that we organise and systematise our experiences, creating categories to help us make sense of the constant stream of data flooding our senses (Esteban-Guitart & Moll, 2014).

Shaull, writing in the introduction to Freire's renowned book *Pedagogy of the Oppressed* (2000) concludes that there is no such thing as a neutral education process, it is either an instrument designed to expedite the integration of young people into the dominant system to create conformity, or it is

the 'practice of freedom' whereby people learn to critically deal with the world in such a way as to be a transformative part of it.

This movement away from what Paulo Freire calls 'banking education', where knowledge is mechanically acquired, towards 'critical education' whereby the learner is an active participant in the appropriation of knowledge through lived experiences (Morrow & Torres, 2002), builds on the paradigm shift towards experiential learning. Vygotsky's (1967) work also challenged the dominant 'efficiency' and industrialised version of education popular for a large part of the 20th century, bringing forth the approach that socially supportive situations increase cognitive abilities (Shephard 2000).

Freire's theory of pedagogy inspired 'educational activism' (Barlett 2005) and laid the groundwork for 'critical pedagogy', which is education guided by passion and principle, and an approach that this practice embodies. Giroux and Simon (1989) call for critical pedagogy "(...) that takes into consideration how the symbolic and material transactions of the everyday provide the basis for rethinking how people give meaning and ethical substance to their experiences and voices" (p. 61). They draw relationships between popular culture and pedagogy, where the latter authorises the adult world through educational institutions and popular culture that is appropriated by young people to help authorise their own voices and opinions (Giroux & Simon, 1989).

Pedagogy as a form of cultural production (Levinson & Holland, 1996) can be utilised to effect political and social change; "Doing critical pedagogy is a strategic, practical task not a scientific one" (Giroux & Simon 1989). These educative projects herein, explored how experiential and non-linear approaches to knowledge transfer could be integrated into learning environments, utilised as a method for rapidly transferring knowledge through divergent communication and engagement techniques.

4.2.1 The Secret Life of Things

The Secret Life of Things (SLOT) was one of my first projects experimenting with the re-framing of the sustainability narrative. The project is based around a series of animations and educational resources that unpack the mythologies and hidden 'lives' of everyday things, using personified narrative as a tool for engagement. The project was initiated in 2010, inspired by the popular YouTube video "The Story of Stuff" by Leonard (disused in section 2.8). The SLOT project ran over five years and now consists of three animations and a suite of curriculum support materials (such as

games, an app, fact sheets and presentations), all of which are housed on a website that is freely accessible for sharing and downloading materials³¹.

The three SLOT animations were created with the aim of testing sustainability communication approaches relevant to design and consumption choices, through the lens of life cycle thinking, expressed in a fun and entertaining way. The animations were to act as a conversation igniter for the topics covered, and within the entire suite of resources as an intervention into educative systems. This work was the first attempt at exploring divergent communication approaches with each successive animation building on experiences uncovered from the previous one. Empirical evidence was gathered through the act of utilising the animations in my educational practice and feedback from educators via the website and workshops were incorporated into the evolution of the work. Much of these experiences of designing and using the tools myself affected the proceeding parts of the work produced.

The first animation, *Life Pscycle-ology* tested out the presentation of information in a five-minute animation, the design involved an intentional wrapping-up of the educational pro-sustainability content in humour and amusing narrative. The project involved a cross-disciplinary collaboration with animator Nicholas Kalincos. Together, we concocted the story for the first animation of Mr Eric Sun, a little mobile phone in the middle of an existential crisis. After being abandoned by his owner for a newer model, Eric visits a past life regression therapist (Dr Fraud) and through this narrative his life cycle stages are explored and a new life is offered to him through recycling and design for disassembly.

The second animation *This is Your Life Cycle* (2013) involved experimenting and re-appropriating a range of pop-culture references in a fun way. The narrative included three badly designed products competing in a game show for the prize of an eco-design makeover. This format allowed us to mash-up a range of different game show formats and present complex information such as life cycle assessment (which is part of the Victorian High School curriculum as of 2012) into fun chunks of information. Content from this animation is now being turned into an interactive app.

The third and final animation released in 2014, *It's the Little Things* was designed for a much younger audience to provide an overarching view of how products have environmental impacts through the personification of a series of inanimate objects through the use of several short vignettes. Each narrative deals with everyday products such as Televisions abandoned on a nature strip desperately wanting to be recycled, lettuces in a dumpster discussing their disappointment about being wasted,

³¹ All animations can be viewed and resources downloaded from the project website www.theseconlifeofthings.com

and underwear on a clothesline discussing the pros and cons of various laundry techniques. The SLOT Project series was about testing ways of counteracting fear based communication techniques by using the lens of fun and positive opportunity-focused messaging. Eco-design is shown as a solution to ironic and identifiable problems. With the release of each animation, a corresponding series of freely available curriculum support materials including fact sheets, games and design briefs—to be used in conjunction with the animations—was included online.

One resource, *The Production Game*, was a PDF based quiz style game designed to be played in the classroom, this was my first foray into games. I play-tested this tool in many classrooms during a project where I taught sustainability to high school students for the Victorian Design and Technology Association. I found the level of engagement incredible, and the learning outcomes obvious in real time as the students responded to challenges, rewards and the excitement of the game-frame. This game would later inspire the *Mythbusting App*, and started my experimentation with game mechanisms as an educative engagement tool. In breaking down the elements of games, I would later find myself using gamified experiences in all of my Projects, from Performative Presentations through to the Interactive Installations. This has formed the foundation for the tactic of Challenging in my work.

The SLOT project started as an attempt to shift small sections of the education field towards the agenda of increasing engagement with sustainability, however, it ended up being adopted in wider social contexts with the animations being picked up by many cultural institutions.

The use of digital communication tools such as animations, according to Mayer (2003), encourages students to build mental representations from the pictures and words presented to them. The premise is based on what is called the ‘dual channel assumption’ whereby humans’ process visual and verbal information in different areas of the brain and each are limited. The ‘active learner’ assumption concludes that meaningful learning occurs when students engage in active mental processing of both visual and verbal situations (Mayer & Moreno, 2002).

At the conception of The SLOT Project, educators from five Australian Universities teaching industrial design reviewed and contributed to the development of the educational resources. Research was then conducted with 257 students at these universities, showing a small increase in identification of sustainability terminology, specifically those who had engaged with the educational resources as well as the animation. Of the students who indicated that the resources had not been useful, they expressed this was due to their pre-existing knowledge of the area (Acaroglu, Ladds, & Grant, 2011).

The initial animation and resource set led to an ongoing relationship with the Design and Technology Teachers Association (DATTA) in Victoria who obtained funding for the continuation of the series. This allowed the second animation to be designed to fulfil the VELS curriculum requirements for high school teachers in Victoria, and the development of a DVD series on contemporary sustainable design practitioners.

Further research into impact was limited to observational research and analysis of uptake, with the animations being watched through platforms such as YouTube, which has recorded views of over 60,000 (however, many other viewing arenas, such as educational settings, and inclusion in exhibitions such as Melbourne Now and the Leonardo da Vinci Museum in Milan, makes it difficult to determine the exact number of views). At the time of writing, the resources have been downloaded over 1500 times. The first animation was awarded a Melbourne Design Award in 2010, and has been translated into 10 languages by volunteers.

This project started my experimentation with message re-framing and intervention design. The approach was ad hoc, but was refined over time. The agenda to effect change in the education of young designers was in-part a reaction to my own experience in design school and from working with educators trying to incorporate sustainability into their practice. It was through the reflective lens of this PhD that elements of this project were distilled, adapted and amplified into new project incarnations, such as the next experiment, The Design Play Cards.

4.2.2 Design Play Cards

The *Design Play Cards* (DPC) project was launched in 2012, with the aim of leveraging the cerebral and emotional delight that games can generate. Built on the work that had been developed for the SLOT project (above), it evolved from the creation of a prototype card-based game exploring this PhD process itself—called the PhD game (this was used to help ‘mine’ my understanding of my own practice and as a method, has since been applied to many other ‘understanding’ scenarios). The PhD game included a set of question cards and time restriction cards. The player would draw a time card, which would restrict the amount of time they had to answer the question (10 seconds through to 90 seconds) and then draw a random question card and have to answer it off-the-cuff whilst audio recording the response for later dissection. The experience allowed for quick-fire production of answers, with the time cards creating pressure to encourage the player’s to draw relationships very quickly—it is consistently surprising what one comes up with—as is often the case with gamified experiences.

Working on methods of re-framing and articulating design for sustainability content, the Design Play Cards included three categories; design ‘problems’ (which set the game play arena), design

strategies (providing frameworks for solving the problems through sustainability) and design inspiration (showcasing real-life case studies and examples for inspiration). The format of the card (a literal frame) provided a unique design parameter, whilst I could only fit a small amount of information, distilled yet allowing for the transference of knowledge.

The deck of 50 cards is available for purchase via a purpose built website³², and in keeping with the share-ability and the user-adaptable culture of these Projects, the entire deck is available as a free do-it-yourself print-and-play set via the website. As a commercial product, the *Design Play Cards* decks successfully sold out several print runs and have so far been translated into two languages by self-initiated translators with the free DIY version being downloaded over 1500 times. Other users have adapted the style to create their own decks (de Neubourg, 2014) with educators also requesting blank versions in order for their students to design tailored problem and solution cards.

I have personally used the cards in many educational settings, allowing me to adapt and explore divergent ways of using play. I have encouraged university students to do a product teardown and then select 3 eco-design strategy cards from the deck to re-design the product to be more sustainable, as well as having had primary school students workshop solutions to the simple card problems (e.g. *toasters burn toast, how do you design a toaster to not burn toast?*). Working with professional designers wanting to increase sustainability literacy, I have used the cards to construct design challenges around the more complex social and environmental problems presented, alongside the inspiration cards demonstrating successful case studies. Anecdotally, the response has been one of empowerment and ease of access, not just from the workshops I have run, but also from the hundred emails and verbal communication I have received from other educators using the cards in their classrooms.

The card format is by no means new, but the concept of framed chunks of information has been experimented with in other formats such as *The Game Changer Game* and the *Mythbusting App*. The size and shape of the cards create a clear boundary for the content and thus enforces a level of clarity in communication, with the text acting more as a prompt than traditional book or fact sheet based formats. They can also be less prescriptive in their use options, allowing for a diversity of configurations between problems, strategies and inspirations. There is also an intended flexibility in use, with several ways of playing suggested, and the open engagement for players to adapt to other uses. As a teaching aid, this was intended to allow educators to set structured problems, while encouraging a diversity of problem solving approaches for their students. In one scenario, I was

³² The Design Play Cards can be viewed and downloaded from www.designplaycards.com

running workshops with educators at a major design college in the United States, when at the end of the session a deck was missing, one of the engineering educators came up to thank me, and hidden in his top pocket was the missing deck! I made a joke about it and he said “please don’t take them away from me, these are brilliant!” Of course, I let him keep the cards.

This project was a departure from previous purely digital educational interventions and prompted the exploration of the visceral nature of tactile ‘analog’ interventions and how these could allow for an entirely different experience to a digital intervention, such as the *Secret Life of Things* animations and *Mythbusting App*. I have found that the cards work to deliver information in a different mode, allowing for framed discussion points around topic areas and problems – the cards literally frame an idea, keeping it small and simple, allowing for a clear arena in which to operate.

The *Design Play Cards* included a distinct iconographic visual style that was later deconstructed and reformulated as the interactive e-book, *The Good Design Guide*; the idea behind this adaptation was that tools like cards allow for group play, whereas a book allows for individual leaning. I started with the design challenge with myself, *how can I gamify individual learning?*. Taking on requests from educators, and looking at non-linear ways of arranging information in standard forms, I started to explore ways of arranging similar content in different formats, in this case a non-linear learning approach. This process of adaptation and evolution has become a formative part of this practice, and I see it as a dynamic response to the interventions within the education system, once they exist they take on a life of their own, they generate feedback, requests and learnings that I can then feed into the evolution of new ideas. This breaking down of information into pieces that can be rearranged and reconfigured in different ways, is also a method that I use during my Performative Presentations.

4.2.3 Good Design Guide

Building on the *Design Play Cards* and the interactive educational resources that were part of the *Secret Life of Things* animations, explorations with content arrangement methods started to evolve. The *Good Design Guide* is an interactive educational e-book on design for sustainability that follows a ‘pick-your-own-adventure’ style format, allowing the reader to jump through personalised lines of inquiry, rather than follow one pre-prescribed flow through the content.

The e-book was launched in 2014³³, and was developed through an iterative process of deconstructing content from previous projects and exploring ways of arranging it in non-linear and playful ways. Born from the experience of attempting to seek out new knowledge quickly myself,

³³ The e-book can be viewed and downloaded from the website www.gooddesignguide.com

and moving beyond the idea that an author need always prescribe how a reader should progress through content. This led to an exploration of how information can be offered in more flexible ways, thereby rendering the user experience more self-directed.

Experimentation with the possibility of interactive PDFs and drawing on the visually identifiable city tube map infographic structure as the basis for the navigation platform, led to the development of a method for arranging over 100 distinct chunks of design and sustainability information in a way that would be easy to follow, accessible and fun.

This Project went through much iteration and was a complicated exercise. There were many complex relationships between multiple items that needed to be expressed, and similar to the development of a website or application, the effectiveness as a productive communication tool is in the user experience design. There were many areas where connections would break and this involved a long process of testing and refinement. Just as I had done in the early stages of my PhD reflection, I broke all the content down into pieces of information that could be arranged in multiple ways on a board and I experimented with content arrangement, scenarios of use and the experience of following one of the many paths of inquiry. This technique has become foundational to the early stage development of my project-based interventions. This 'mining' and 'dissection' process is a recurring practice theme, from the dissection of electronic waste during the Interactive Instillation the *E-Waste Autopsy*, through to the Disruptive Design Process outlined in section 5.3.

In adopting a standard mechanism used in narrative based computer games, coupled with inspiration drawn from *choose your own adventure* books, this has allowed for an experimentation with arranging information in non-linear ways, exploring how static information can be gamified using smart arrangement and presentation techniques (Deterding, Dixon, Khaled, & Nacke, 2011).

The e-book project completed what became a three-part experimentation with educational interventions utilising fun, humour and play through different mediums that could be adapted by others. Each of the Projects built on the one previous, allowing for an iterative adaptation process as discussed in the Disruptive Design Process (Section 5.3), critical to the proposing of new knowledge evolved through this PhD.

Part of the intent with these Educational Tools was to find ways of designing myself out of the role as 'knowledge-transferrer'. I wanted to find ways of relating my tacit knowledge to other educators, to design myself out of the scenario was essential to the self-imposed brief. At the time I started these experiments, I was being asked to attend schools and universities around Australia to provide the design for sustainability module, and whilst this was an excellent opportunity, there were only so many schools I could attend in person. This demonstrated demand, and following opportunity

analysis resulted in new system interventions being designed. These explorations with educative formats greatly expanded my approach to pedagogy and started to feed into the other project mediums with which I was experimenting at the time—namely Interactive Installations that encompassed play as a core part of their experience.

4.3 INTERACTIVE INSTALLATIONS

Throughout The Projects, an aspiration of making change by incorporating curated user experiences (McClelland, 2005) has been paramount to the design process. The use of interactivity is intrinsic to all The Projects, but specifically in the three examples below, tactics used to implicate play and interactivity have been tested in a variety of ways. Where the Educational Tools focused more on the tactic of Challenge, these Projects explored developing the tactic of Play.

Dewey and Freire's work revolutionised the educational landscape encouraging a shift away from structured stand-and-deliver style learning to a more experiential and student-centric approach. Critical pedagogy and experiential learning techniques have stimulated contemporary and divergent modes of educating, and so, these experiments were explored to develop a critical pedagogical approach. Dewey (2007) speaks of experience stimulating curiosity and developing initiative, and while play is fundamental to curiosity, these projects seek to ignite curiosity in the participants, young and old.

Interactivity has been explored in a multitude of ways throughout these projects, and these three works specifically take on physical real world incarnations. Being 'alive' they require not only interaction with content but active 'playful' participation. This allows for random transactions to occur within a defined 'space', not dissimilar to the frame of a card as a physical tool for setting boundaries within which to operate. Critical to this form of interactivity, is the constructed environment in which they are operating. Like any play arena, a game must have rules and restrictions of time and resources that work to create a framework of experience, yet in these cases, the agents are implicated in the collaborative curation of what occurs within the set time frame.

For Barker (1994), interactivity in learning is "(...)a necessary and fundamental mechanism for knowledge acquisition and the development of both cognitive and physical skills" (p.1). Discussing the art of interactivity in instructional design, Sims (1997) explores mechanisms for creating successful interaction intrinsic to individual discovery. As a facilitator of these experiences, I built in allowances for hyperactivity, chaos, calamity and randomness, all working to engender self-directed curiosity. During this process, I learnt to dynamically respond in real time to the needs, wants and responses of the participants.

The next three Projects discussed, seek to create momentary experiences of play that covertly and overtly offer opportunities for intrinsic change in conceptual understanding, active presentation of what sustainability is, and the role of design as a social influencer. Each of these experiments sought to construct a framed space that allowed for playful educative experiences that would live beyond the momentary encounter.

4.3.1 The Repair Workshops

The Repair Workshops were a five-day collaborative exploration of the concept of 'repair' run as part of the 2011 *State of Design* Festival. Based on the Repair Manifesto which had been developed by Platform 21 in the Netherlands (Platform21, 2009), the project sought to create an interactive experience of repair featuring nine professional collaborators, and a host of partnerships to seek out ways of engaging the public with re-use and repair.

There were two main elements to this interactive installation. Over the first three-days of the project—held in the basement of Donkey Wheel House in Melbourne—pairs of technical and creative collaborators embarked upon a shared exploration of how broken items could be re-invented. These studies took place within closed workshops and utilised over 2.5 tonnes of salvaged waste that was destined for landfill, provided by project partner charities: The Brotherhood of St Lawrence and St Vincent De Paul Society. Each of the five collaborative pairs re-imagined or repaired the waste into new functionally relevant items, and at the end of the three days a public exhibition and live auction of the works raised money for Environment Victoria.

The ensuing exhibition and auction launched the public component of the project, leading to the public engagement program, where people could pre-register for a free repair session. Over the installation's weekend, more than 500 people came through the space with a total of 70 repairs conducted. People opted-in to a repair session, and once assigned a repairer they were guided through the experience of repairing. This experience was designed to offer moments of tacit knowledge transfer between repairer and participant. Some spent hours working through the challenge of discovering what was broken and how to repair it. The atmosphere was that of playful discovery and possibility.

The ambitious agenda of the project was to amplify a conversation about the demise of repair and how mass-consumer products are often designed to break. As an intervention, it was intentionally designed to be experience-based and have mediagenic potential with a large portion of time and energy being invested in generating relationships with the media as a tactic of amplification. To this end, the project was the subject of several radio interviews, magazine and newspaper coverage (Blackwood, 2011a; Kappel, 2011; State of Green, 2011), blogs and twitter conversations.

Upon reflecting on this project, I started to uncover the role of performance in public presentations. As facilitator I, along with my collaborators, played several character roles that enabled a particular type of experience to evolve for the participants. At the time this was not obvious, but as I later started to develop this practice of curating playful experiences, I increasingly developed character roles to play out. In both this project and the *E-Waste Autopsy*, lab coats were worn, signifying the experimenter. Natalie Jeremijenko also uses costumes as part of her work in the Environmental Health Clinic.

The experience of participation, interactivity and amplification gained through this project was later distilled and adapted for the next Interactive Installation, *The Design Play Days*.

4.3.2 Design Play Days

The *Design Play Days* commissioned by the National Gallery of Victoria's (NGV) education team, ran three times during December 2013 to February 2014 designed as an educative exploration of how play and challenge can be used as a platform for experiential based learning. Each session was planned as an immersive experience, involving high-energy playful ways to explore design for sustainability. Over the three separate days, some 200 school children participated. Each session went for 90 minutes and involved three 'design thinking through sustainability' challenges using waste products collected from the NGV's waste stream, and designed specifically for the project in collaboration with the NGV education team.

In curating this experience, I looked for ad hoc opportunities available through the NGV. A bag of white un-used T-shirts were diverted from the waste stream and then put to use in an activity where students were required to estimate the life cycle of a cotton, bamboo or polyester T-shirt. The teams then drew the life cycle on the T-shirts as a design feature. Another activity was to create a self-propelled vehicle using a range of waste materials (paper, foam, cardboard etc.) and additional items (rubber bands, pushpins, tape and skewers) and then race their creations to see which would travel the farthest. The final activity was intended to tie in with the geodesic dome in the foyer of the NGV, and involved dematerialisation and material lightweighting. In teams, students built truss bridges with toothpicks and sweets between two chairs, with the bridge that could hold up a book for the longest winning the prize. All activities had tight time restrictions placed upon them and the students were placed in randomised groups to increase the experience of a collaborative community.

This project built in playfulness as a platform for knowledge transfer. After each session, we refined the activities and sought to distil the learning objectives through the act of play. The activities used game mechanisms of time restriction, challenge and reward to ignite the curiosity of the participants.

An article covering the project published in the NGV Gallery Magazine provides the perspective of the journalist who was present during the project, she writes:

“The clock starts and the students attempting the bridge challenge hurriedly brainstorm designs and experiment with the materials. Toothpicks are squeezed into the soft jube lollies and wild assortment of shapes materialise. Twenty minutes feel like two and the constructions must now be tested for their strength and engineering prowess – will they work? Each bridge is laid out across two stools and a pile of books is placed on the constructions. A suspenseful hush fills the room: some of the bridges absorb the weight, provoking sighs of relief. But when one of the bridges collapse the room erupts into a roar. As the group of students rotate through the three challenges they are required to experiment, be bold and think creatively about design, purpose and unintended consequences.” (Hannah, 2014, pp. 56-57)

This Project built on the learnings from the *Design Play Cards*—using framed boundaries to set an experience arena from the role of implication discovered through the *Repair Workshops*. The development and enactment of this project evolved a process of facilitated play, which was later translated into the next commissioned work for the NGV, *The E-Waste Autopsy*.

4.3.3 E-waste Autopsy

This live performative Interactive Installation took place in early 2014 at the National Gallery of Victoria’s Community Hall as part of the Sustainable Living Festival. When initially approached by the NGV, I decided to build on what I had learnt through the *Design Play Days* and wanted to create an interactive experience that allowed for a framed engagement with sustainability and design.

The project would publically critique the environmental issues associated with electronic waste generation, but seek to do so in a fun and performative way. So it was the NGV’s e- waste—their computer paraphernalia—the public was invited to help dissect. In a live autopsy, participants were enlisted in the creative process of dissecting and then rearranging the components into an artful autopsy array. My collaborators and I wore lab-coats and encouraged people as they pulled apart keyboards and computer mice, to discuss how they were made and if at all they would be recycled. A digital display on the wall pointed to the design faults in e-waste and the systemic social and environmental issues of e-waste trafficking, assisting with igniting conversation around the topic. This particular intervention’s intent was to create a momentary discussion of e-waste with the ‘why’ and ‘how’ of the design of these products, resulting in reduced recycling and the perpetuation of waste.

There was a strong visual experience with this project, as the items were collectively dissected, the parts progressively encroaching on the workspace, the sheer volume of components and complex

parts became a visual reality to all involved. At the end of the dissection (once all the 100 items of e-waste had been dissected and laid out) a 'weigh-in' was conducted. All the recyclable and non-recyclable parts were theatrically weighed and documented. The entire process was captured in stop motion and a short propositional video was made critiquing the design of electronic goods.

The *E-Waste Autopsy*, like the other Interactive Installations, allowed for a constructed frame of experience facilitated by a designed performance that evolved in real-time, dynamically responding to the participants. Each of these Interactive Installations allowed for experimentation with different forms of interactivity, the tactic of play and experience-based learning. Gamified mechanisms of time restrictions, challenge and reward were all built in.

Whilst each of these installations targeted different groups, the practice learnings gained from enacting them led to the valuing of challenge and play as tactical ways evoked during this change-making praxis. However, it is of course hard to measure success in terms of change outcomes from any such project, such as these momentary interventions. One would have to conduct a longitudinal analysis in order to clearly determine if such experiences have long term effects. Thus, the learnings derived from these projects are more concerned with practice components evolved through the experience-based understandings gained by the practitioner. The children during the *play days* themselves tell you right then and there what they have learnt. One young participant wrote on her feedback form that it was the most fun she had ever had learning. A woman in the *Repair Workshops* who had brought in her broken 1950's toaster—which she had received as a wedding gift—also brought along some bread to check if the toaster would work at the end, explaining how happy she was to have someone would try and fix something so dear to her. Conversations with the adults engaging in the *E-Waste Autopsy* responded with awe and wonderment at their new learnings, and one can deduce that, at least momentarily, these participants had a change of mind or perception as a result of the Projects.

4.4 PERFORMATIVE PRESENTATIONS

Performing in a socially constructed arena—presenting a 'talk' or 'lecture'—allows for the performer to present a neatly packaged range of ideas. It is a type of designed product; the brief is set and the 'product' is the constructed narrative delivered to the specifications of the audience. As Shakespeare said, "All the world's a stage, and all the men and women merely players" (Shakespeare, 1890, p. 6). Everything performs: humans, plants, and products. A toaster performs the act of making toast. A plant performs the task of turning carbon dioxide into oxygen. Humans perform the rules of social order. This is the Performance Principle (McKenzie, 2002) and this practice has evolved into a performative process of seeking to ignite change. This realisation started

to evolve through the Interactive Installations and the experiences of teaching design for sustainability in classrooms. Through this, I started to question what I needed to add to my practice in order to make the transfer of knowledge more effective.

In a Performative Presentation, the practitioner becomes the actor; one must embody their practice in order to present it. I prefer to have a two-way conversation with the audience; they are also participants in the act of performance, the performer utilising a conscious choice to implicate the audience as part of the performance, while employing the tactic of challenge. To this end, I design presentations to be self-amplifying in that they embed chunks of information via short narratives—ideas that can be transmitted and shared later by the audience. Usually, these are the counter intuitive facts and relatable notions associated with everyday things. I have found that the intrigue of mythbusting and the challenge of ‘what you do or don’t know’ helps to activate the audience’s participation in the performance.

In preparing for a public performance, I take the brief, break it down and develop a series of vignettes of narrative, these chunks of information live in my head as a series of conversational opportunities and when performing I draw on them, piecing them together in real-time as a dynamic response to the audience. The narratives are like jigsaw puzzle pieces that slot together to make a whole based on the live experience. As a form of improvisation, this seeks to playfully translate change and ignite inquiry in the audience. The liminal process of performing, of delivering on expectations is part of the narratives that I use in this practice. Performance is part of the everyday gestures of social resistance, and conversing is seminal in the act of performance (McKenzie, 2002).

There is much responsibility that comes with being given a platform to speak from and I feel the weight of this each time I take to the stage to present. Certainly this was the case when given the opportunity to present on the TED main stage. I don’t take the responsibility of being offered a public platform lightly, being given the space to share ideas and passions with others is something I take great pride in and the ways in which I construct a presentation is much like anything else I design—a bricolage of experiences and narratives curated with intent to effect change. These Projects were opportunities, whereas many of my other Projects were intentionally designed interventions that I sought out. However, these allowed for specific tactics to be tested in unique ways. The learnings from these two presentations have been seminal in the development of this Disruptive Design Practice, as they allowed for a significant amplification of the ideas of sustainability in design.

4.4.1 TED Talk

An invitation was extended to submit an idea as part of a global TED Talk talent search. I was one of twenty Australians selected to perform at a special talent search audition event at TEDx Sydney, in 2012. I had only a few days to prepare the five-minute talk and as I took to the stage, adrenaline and excitement fuelled me through the performance. The talk was displayed online alongside the other presenters, and the global public was given an opportunity to vote on which talk they were most interested in seeing expanded, after which the curators at TED selected a handful of people from around the world to present on the mainstage at the Los Angeles TED event in 2013³⁴. This was a significant validation of the methods that I had started to develop and hone through this practice, and in a small way demonstrated that I was communicating ideas in effective ways.

Two entrants from the Sydney talent search were invited to attend the main TED conference. I found out I was one of these two in October 2012, and had almost five months to prepare—in hindsight that was about 4.5 months too long. Self-imposed expectations, performance anxiety, fears of not being good enough (or of not being understood) and the well-intentioned but utterly petrifying comments by others took their toll on me. Performance is about confidence, in what you know but in also the delivery, and the later was the part that I struggled with.

I took to the task of designing a TED talk by workshoping the content with whomever would listen (even strangers in pubs). I dissected the content I wanted to deliver into three main sections and started to frame up three narratives that would fill my 18 minutes. As part of my research, I watched countless TED talks and found there to be no particular formula for a good one, except that many had a strong use of narrative and emotive presentation styles, occasionally speakers included a joke. At this point, the TED instruction book arrived in my inbox. The pages of do's and don'ts only added to my confusion and anxiety. 'Stand centred on the stage' (*but I have to pace when I talk*). Practice, practice, practice was the general gist of the book (*but I prefer to speak off the cuff using a range of pre-prepared but not rigid narratives*). But it was TED, so I took the advice and ran counter to my usual design approach, running practice sessions with friends, students, strangers and peers. I even surveyed them to find out what was good, what should go and what they thought was funny. This was TED talk design by consensus, not by my intent. I engaged over 100 people to participate in my TED test runs.

³⁴ The TED talk can be viewed online at: <http://on.ted.com/EnvironmentalMyths>

With hindsight, taking on-board all of the feedback was not the best idea for me. By the time I got to rehearse on the TED mainstage, I had a cacophony of voices in my head of what I should and shouldn't do. Perhaps because of this noisy confusion, or perhaps because of the nerves, when I did my practice run I was stopped and informed that it was not working. Three days before I was due to deliver my talk, I was asked to rewrite it. I realised that I had designed myself out of my presentation. It was so rehearsed, so prepared, and I was so un-natural in my delivery that I went into autopilot delivery mode, losing the impassioned approach that runs through and drives what I do. This confirmed two important things for my practice, that one of my strongest assets as 'change-maker' is performing with passion and conviction, and secondly, that I should always trust my method. Although, sometimes one needs to be tested to discover what one already knew to be true. The end result was that when I took to the TED stage, I essentially winged it, pulling on the vignettes that I had created in a random order to form a bricolage narrative in real time. This was an improvisation, a 'perform or else' (McKenzie, 2002) situation that reinforced the concept of passion as being a powerful communication tool, one that speaks louder than perfectly rehearsed lines.

From this process of designing and delivering the TED talk, I also started to develop a method of verbal communication design that instead of constructing a rehearsed rigid narrative, I would create a range of narrative 'nuggets' that could stand alone as units of transferable currency. These narratives could then be interconnected and rearranged in a variety of different ways—not dissimilar to a deck of cards. This method of narrative design has allowed me to refine the tactic of storytelling embedded within this practice, and was tested in the next large audience presentation that I was invited to do for the AIGA.

4.4.2 AIGA Talk

Several months after I spoke at TED, I was invited to present a keynote address in Minneapolis for the American Institute of Graphic Arts (AIGA) annual conference³⁵. I saw this opportunity as a unique chance to access almost two thousand designers and as a place to test out some of the devices I had started to uncover through the practice explorations, specifically seeking to incorporate the performative component of the presentations. I wanted to explore ways I could make the conversation increasingly relevant, accessible and transferable. Working through the methods of re-framing sustainability, I tested new metaphors, analogies and storylines that could be employed as bridges for knowledge transference.

³⁵ The AIGA talk can be viewed at www.aiga.org/video-HHH-2013-acaroglu

To this end, I constructed a series of stories that I could draw upon based on my own personal experiences, detailing what I have done in my change-making practice and why it is relevant for designers to incorporate pro-sustainability into what they do. Further to this, I wanted to find more interactive methods of engagement, and thus opened with a word association question about the terms 'eco, green, and sustainable' and asked for the audience to call out the first words that come to mind. The responses were as predicted including, 'recyclable', 'hippy' and 'tree-hugger'. The latter made for a perfect transition to the next slide, an image of a woman hugging a tree. At this point, I told the personal narrative of how I am always pigeonholed as being a so-called tree-hugger because I work in sustainability. For me this is part of the re-framing of the dominant schema that caring about the environment means you have to hug trees, or participate in similar 'green' activities. Of course not everyone thinks this, but in challenging this myth, I was seeking to open a space in the audiences' mind for the possibility that they might be implicated in the sustainability conversation even if they didn't identify with this narrative. I have found that the use of call and response questions have a way of implicating the audience and creating a space for participation. In using personalised narratives, I started to notice (from post-presentation conversations) that this allowed people to connect through shared experiences.

Since these two examples of performative presentations, I have had many further opportunities to refine the tactic of storytelling and test the boundaries of performative presentations. The role of 'change-agent' is awkward at times. I have found that I may sometimes be the inspirer, but I am always the provoker, just like any performer I have started to refine the character roles I step into, distilling more power and intent into each role. When looking at this as a form of systems intervention, one can see the ways in which video recorded presentations amplify messages. My TED talk has had over a million views, how many of these were viewed in full is not known, yet this kind of reach can be mapped through the interaction of those that in turn reach out to me. I have countless emails from school children to retirees telling me they have been inspired, and what actions they are now taking, there is even some design solutions that acknowledge my talk as their inspiration (Hickey, 2015). From these high profile talks, I learnt that passion is a transferable language of change-agency and that the art of storytelling is critical to developing and enacting my Theory of Change.

4.5 GAMES

These following two Projects focus on education, engagement and communication specifically; through gamification they have their own category as they were designed as gamified experiences

first and foremost. They are tools designed to be employed by others and explore the use of the play as a foundational tactic.

Gamification uses game-based elements in non-game situations (Deterding et al., 2011) through incorporating game mechanics such as rules, rewards, losses, tokens, badges, levels and leader boards. This encourages an increased user experience, enhancing the level of interaction. Gamification is used to make learning fun and enjoyable, by building in stories, autonomy and meaning that provide boundaries for play (Kapp, 2012). This provides “motivation to succeed and reduces the sting of failure” (p. xxi). In these projects, I explored the use of game-based mechanisms to wrap up educational content and provoke divergent thinking in the player. The interventions use both digital and analog gamification mechanisms threaded throughout all of the Projects presented herein, and yet these two were specifically designed as game based gamified experiences seeking to effect change in the wider community, rather than just an educative setting.

4.5.1 Mythbusting Sustainability App

The *Mythbusting Sustainability App* is a quiz-based application designed to address common myths about sustainability through a fun gamified experience. Building on the PDF based *Production Game* developed for use in the classroom as part of the first SLOT project, the new digital game employed multiple-choice questions in a quiz style format within which a mini arcade-style game was embedded.

In early 2010, interviews were conducted with designers following eco-design training workshops, regarding what it was that they felt would help them engage more with sustainability in design. One designer answered ‘an app!’ At this time apps and iPod touches were still quite new. After observing the public constantly playing on smart devices, I wanted to experiment with the use of digital gamified apps as an educational platform and so I set about designing one. At this time, a new app had been released by Cook (2014) as an educational tool called ‘The Sceptical Scientist’, which essentially targeted common myths about climate change in an easy to access manner, and inspired an exploration of adapting this approach. I analysed many of the apps on the market that were ‘educational’ and found that the static transfer of information didn’t implicate the player, and so I wanted to use a mechanism that would hook the player into going through the information in order to get to a fun part, thus engaging with the educative content.

Apps are interesting mediums as they are self-directed and usually played alone—differing from many analog games that require participation of others. This means that mechanisms of challenge and reward need to be implemented in different ways in order to maintain engagement. The idea for this app was to combine gaming principles with life cycle based scientific facts, and this required

a format that would engage the player through a desire to be rewarded in some way. This resulted in a game-within-a-game approach: answer 3 multiple choice questions and you unlock a mini game that is based on the arcade game 'whack-a-mole' and here you can earn extra points.

The app format is quite simple, 50 multiple-choice questions randomised over three rounds with three questions each round. After a question round, the mini-game is unlocked, with the aim being to trash or recycle the items in the right garbage cans within 30 seconds. Points are gained or lost based on correct or wrong tapping. Once the entire game is finished the player is shown their total score from each round combined with the mini-game, then this final result is then compared to the highest possible score of 1200, challenging the player to become an Eco Innovators Champion.

The underlying learning objective of this game is to challenge common misconceptions about sustainability. Thus questions are all based on counterintuitive information about product life cycles and environmental issues. For example, the idea that a compact florescent light globe is worse for the environment than an incandescent globe due to its mercury content is challenged with life cycle data which explains that there is more mercury released through burning brown coal than there is through the compact bulb (David, 2006).

Humour and playfulness are also integrated: for example, 'from which end of a cow does the methane emerge?' Options: the front or the back (the answer is the front). When a player selects an answer, whether right or wrong, they are provided with the correct answer and why it is so, seeking to provide that 'ah-ha' moment in the game. All of the facts are hyperlinked to their original source material for further research if the player is interested.

The *Mythbusting Sustainability App* has been available for free download on the IOS operating system since 2011, and has been downloaded over 3500 times. Apps are complex things to design resulting in much learning about user-experience, play mechanics and play testing. This app was an extension of the Production Game mentioned earlier, and the leanings from this would influence the next series of games—albeit analog rather than digital.

4.5.2 Game Changer Game

The *Game Changer Game* is a card-based game designed to assist community organisations and communicators in generating divergent approaches to sustainability-focused campaigns through positive message framing. The game facilitates the dissection of a campaign aim, the framing of new approaches in reaching the aim, and the generation of ideas based on a 'played' round. The game is an idea generation toolkit, with several components that can be played in small or large facilitated groups. The box includes quest cards, reward tokens and 4 sets of hexagonal playing

cards used as thinking lenses. The quest card assists with setting the campaign goal and provides the frame for playing each round. The four hexagonal cards present different constructed frameworks to approaching the set problem or campaign goal by utilising personas, examples, approaches, and scenarios. These are presented with clear text and demonstrative icons, whilst the size and shape of the card, restricts the amount of content and allows for different methods of engagement. The reward tokens allow players to indicate through peer-review who they thought had the best ideas in the group after each round. This creates both competition and reward. This component was discovered during play testing to be the critical part of the game, and without this, there was less motivation from players to push themselves, once the tokens were introduced and there was a public peer-review process, the players increased their participation seeking acknowledgement from their peers.

This project came about while undertaking a variety of change and communication-based research projects. These research experiences identified an opportunity to explore and illuminate the diverse methods of current communication techniques employed by and within the sustainability community. From social marketing and traditional advertising campaigns, a consideration of divergent communication approaches based on existing methods was developed.

This intervention evolved from the 'preaching to the converted' statement often used within the sustainability sphere (Matthews, 2012)—meaning that many campaigns and projects are only reaching individuals who are already invested in sustainability. The opportunity to develop a tool that encouraged people within the sustainability space to approach campaigns from a different angle was experimented with. Through working with not-for-profits and the development of affiliated communication projects, it was understood there was a very different approach taken by the social/sustainability space to that of the mainstream marketing community. Sustainability communications often relies on moral, community and ethical arguments³⁶ as the framework for engagement. However, this is not always effective, by focusing on moral panics and fear campaigns in climate change communication, it was found that some pertinent studies were showing an opposite effect, and were in fact causing increased disengagement (Janis & Feshbach, 1954; Mulvaney, 2010; M. Nisbet, 2010; O'Neill & Nicholson-Cole, 2009; Ruiter et al., 2001).

Engaging groups of professionals in this type of play, required different mechanisms to that used in the *Mythbusting App* and the *Design Play Cards*. Throughout the interactive phase of the product

³⁶ An unpublished report was prepared by students that I was mentoring which sought to identify the types of communication approaches employed by different groups (sustainability, social marketing and traditional marketing); the outcome of this research was a series of approaches that drew on successful marketing campaign strategies. This research assisted with the framing and approaches integrated into the Game Changer Game.

development (which spanned two years), I play-tested different mechanics with several environmental organisations and discovered the need for direct feedback loops, realised in the form of motivator cards and reward tokens. The 'quest cards' creates a collective challenge that the group joins in to collectively solve, while the addition of the reward tokens then provide an extrinsic motivator for individual players to challenge themselves in the play.

These explorations in digital and analog games provided several key learnings; games can stimulate intrinsic motivators through their design; group play requires different mechanisms to digital self-directed play and that the act of playing is educational through the joyful experiences earned, but also through the activation of intrinsic and extrinsic rewards—all pertaining to the design of the experience of play and its implication in educative environments.

4.6 CHAPTER 4 - CONCLUSION

This chapter has detailed The Project based interventions designed and performed through this body of work and explored different modes of transferring knowledge through a variety of educative propositions to the field of communicating sustainable design practice. In reflecting on how this has achieved project-based learning, the Projects have enabled the emergence of an arena for testing tactical ways of operating within educative, communicative, gamified and performative propositions.

The role that these Projects play in addressing the research question, of developing an agenda-driven pro-sustainability change practice through disruptive design, has evidenced modes of explorative operation, distilled into three Tactics of challenging, storytelling and playing that enable an approach to enacting change in and through my practice.

As a body of work, these Projects have built upon themselves, each being an adaptation and evolution of the last; the cumulative outcome being a cycle of designing interventions, whereby opportunities are identified, and an intervention mechanism of experience is designed, tested and followed by the refinement of an idea, implementation, reflection, and then followed by the evolution of the idea into a new intervention, and the cycle continues. This process forms the bases for the Disruptive Design Practice outlined in Section 5.4 of the exegeses, and within which the claim to new knowledge is made, evidenced through these experimental projects.

5. THE PRACTICE

5.1 CHAPTER 5 - INTRODUCTION

Firstly, this chapter discusses in detail the Tactics that have been born of and formed through the Project-based explorations. The pragmatic application of these tactical ways is of great significance to this body of work. Through the research conducted, and the designed interventions explored, new change-making work is evolved through a continual cycle of development. The latter has formed the bases of a Disruptive Design Practice.

The methods employed by this practice draw on educational experience theories and action research to develop, experiment and enact disruptive interventions as part of a change-making praxis. From these change propositions, three ways of tactically operating have evolved: *challenging*, *storytelling* and *playing*. Each proposition contains many sub-tactics or devices, deployed in multifaceted ways (and outlined in relation to the Projects in Appendix 2).

The proposition of the Disruptive Design Practice detailed in this chapter has evolved through the practice's experience and a detailed reflective exploration of the theories relating to social, behavioural, and cultural change. Communication in the everyday and the ways in which knowledge can be transferred, is provided at the end of this chapter.

5.2 TACTICAL WAYS OF OPERATING

For Michael de Certeau (1984), tactics are calculated actions in which one should “vigilantly make use of the cracks that particular conjunctions open in the surveillance of the proprietary powers” (p. 36-37). Central to this practice is the poaching of power through divergent ways, designing and implementing interventions into a system in order to leverage positive social change outcomes. De Certeau describes tactics as the tools of the disempowered, formed through a bricolage of what one has available to them.

Within this practice, tactical ways of operating are used to activate and provoke pro-sustainability change through disruptive interventions into existing systems, and poaching power from mainstream modes of communication by appropriating what is available. Examples of this are the *Design Play Cards* adopting the well-known frame of a card game to intervene in the ways in which sustainability is communicated in educative settings. De Certeau's (1988) framing of tactics claims that what is won

is not kept, those outside of the institutional powers are constantly having to manipulate events in order to create opportunities, using clever tricks and 'knowing how to get away with things' (p. xix), this power-play performs throughout society.

Power is a commodity traded within fields as discussed by Bourdieu (1977); the games which people play out in social arenas allow for transactions of resources such as power. Berne (1996) determines that games are a predictable and patterned series of transactions that are potentially plausible, but actually hide motivations leading to a definable and predictable outcome; "they are habitual, dysfunctional methods of obtaining strokes, and the people involved are not fully aware of the two levels of transactions in which they are engaged" (p.5).

Evidenced through this work, I suggest that the calculated use of tactical ways of operating, allow for a shift in power away from dominant forces to create opportunities that allow for the claiming of new spaces that can leverage positive social change outcomes. It's hard to prove this empirically, given the nature of change (which I outline in my Theory of Change), but the anecdotal evidence experienced through these Project-based interventions suggest that certain tactical ways allow for small shifts in power structures, and at the very least work to empower the practitioner and the participants at the moment of intervention.

In looking at forms of social representation in the everyday, de Certeau (1984) speaks of the ways individuals can subvert dominant systems and rituals imposed upon them. According to de Certeau, active participation in the authoring of one's own experience of the everyday is a fundamental tactic used to open up space for alternative voices in the subjection of social control. It is through tactical ways such as *participation* that one explores and experiments with subverting the dominant cultural and social norms that perpetuate un-sustainability.

Participants in a system are controlled by strategies governed by the status quo, yet can tactically operate in ways that challenge and subvert in order to maintain autonomy over their existence (Goff, 2010). It is through the application of these approaches that The Projects have effectuated their objectives. An overview of Tactics used in each project and the sub-devices within each tactical way are shown in Appendix 2, below I will concentrate on detailing the three tactics fundamental to this practice: Challenging, Storytelling and Playing.

5.2.1 Challenging

At a meta-level, this body of work is concerned with challenging how sustainability is framed, the constructs of mass-consumerism as normative practice (the status quo), and the ways in which social and environmental considerations in design and society more widely, are communicated.

The tactic of *challenging* involves utilising a provocative approach to making change. Disruptive interventions into every-day ways of doing are implicated in a systems level change agenda (Shove & Walker, 2010), while challenging is inherently interventionist, seeking to disrupt the current course or trajectory of a system. Re-framing the way in which sustainability is viewed and communicated has been a major concern of this body of work. Within the Performative Presentations, dominant myths about what constitutes 'environmentally preferable' behaviours are challenged, and the construct of what normative pro-sustainability actions constitute, are re-framed.

To this end, Performative Presentations work to challenge constructed frames within the sustainability arena. By leveraging peer-reviewed published data through life cycle assessments, it is possible to construct narratives that challenge dominant green-myths. Constructing encounters that are counterintuitive, daring the audience to answer questions whereby they commit to an answer based on their assumptions, and then demonstrating, based on scientific research how these assumptions may indeed be incorrect, sets up *challenging* as a vehicle for delivering change. Similarly, the creation of gamified environments where players are incentivised to be imaginative in their answers, and through the experience of competing, engages players with content in a more personally invested way.

A study conducted by Dereck Muller (2008), looked at different ways of communicating basic scientific facts (such as Newtown's Laws). He created a communicative video clearly demonstrating the laws of gravity but found that this did not increase a student's ability to answer a test question on the subject correctly. After further investigations, Muller predicted that the issue was with pre-existing mental frames— students assumed they knew the answer based on their existing experiences of the world. In fact, he found that the videos reinforced the prior knowledge even if it was completely incorrect; the students selectively heard what fitted their existing knowledge frame³⁷. To combat this, Muller conducted a new experiment, again creating a video explaining gravity, but this time with two people in the video—one voicing the common misconceptions and the other person indicating that the assumption was incorrect. Together these two work out what is correct through social dialogue. This latter experiment increased student test results, despite their indication that they found the video confusing³⁸. According to Muller, leading with the misconceptions, challenges the viewer to reconstitute what they already believe to be true.

³⁷ In psychology literature this is known as 'confirmation bias' (Nickerson, 1998); the tendency for people to seek out information that confirms a pre-existing hypothesis or level of knowledge, and avoid information that contradicts one's worldview.

³⁸ Muller's PhD study was summarised during a TEDx Sydney talk (D. Muller, 2012) whereby he explains that in the initial study students were given a test with 26 physics questions with the average results being 6

Challenging might be uncomfortable for the audience, yet it has been found through this work that it increases the cognitive engagement and assists with the re-framing of pre-existing knowledge. Projects such as the *Mythbusting Sustainability App* and the TED talk work to challenge the ways in which sustainability is framed in design and social practices. For example, common 'green-myths' like the notion that disposability can be alleviated by replacing synthetic materials with bio-based materials (Hertel et al., 2010), perpetuates the idea of disposability and can act as a validator for consumption; as does the proposition that recycling reduces environmental impacts. Whilst the latter does indeed assist with environmental impact reduction, consideration of the socio-technical consequences of such options must also be taken, otherwise one would miss the rebound effects (Hertwich, 2005) of such guilt-alleviating processing and not notice the wider social and environmental impacts that land transfer has on the environmental health of the planet (Findlater & Kandlikar, 2011; Hertel et al., 2010). Such big picture myths are challenged through the TED talk and the *Mythbusting App*, providing opportunities to participate in alternative narratives—*how could this be different?*

5.2.2 Storytelling

Narratives delivered through storytelling are a basic mode of human interaction fundamental to knowledge acquisition and transfer (Hinyard & Kreuter, 2007). They are, therefore a powerful medium for narrating experiences and ideologies of change (Davis, 2002). As a tactic performed through this practice, stories have the ability to themselves perform, multiply, reframe and resist dominant narratives. They are the vehicles through which the educative experiences are embedded and by weaving narrative lines of inquiry together, they form the products with which one can mentally buy-into or selectively opt-out of the propositions.

As a form of communication, stories are the “primary form by which human experience is made meaningful” (Polkinghorne, 1988, p. 1). It is through stories that we learn and interact. Within this practice, stories are the vehicles in which the knowledge transfer is brought about. Narrative based communication approaches are used to re-frame and construct conversations that highlight divergent ways of doing and propose the pro-sustainability modes of operating and thinking.

Brown and Humphreys define the use of 'epic narratives' to construct a clear change agenda, their research concluded that change is encoded in narratives presented by change agents. Narratives are critical to the ways in which I enact this change-agenda. From the developed method of *reflective talking* through to the approaches of re-framing, critical terms and concepts and the Performative

correct answers; after watching the explanatory video the results went up to 6.3, and whilst post watching the social dialogue video the students averaged 11 correct answers out of 26.

Presentations enacted through this practice—I construct epic change narratives as part of the agenda to activate positive social change.

Personification is one such storytelling method used. In the *Secret Life of Things* animations, this tactic is used to endear the audience to the inanimate lives of everyday objects, such as mobile phones, lettuces and televisions. The everyday item comes to life through the telling of its story. Through this personification of everyday objects, an emotional connection between the audience and the anthropomorphised thing is forged. This technique, known as ‘it-narratives’, became popular in eighteenth century literature (Blackwell, 2007). Experimented within the first animation *Life Psychology*, the main protagonist, Mr Eric Sun, is an abandoned mobile phone who is emancipated from his existential condition through the discovery of his construction using past life regression therapy, thus identifying himself with the audience through his human-like condition. This tactic was employed in all three animations to varying degrees, such as the talking lettuces in *It's the Little Things* who express their sadness at being wasted, telling the audience of their personal desires to have achieved something in their lives (such as becoming a Caesar salad), and the fictional products playing as contestants for an eco-design makeover in the game-show format of *It's Your Life Cycle*. These types of narratives are dissected for their powerful communication potential by Sachs (2012).

The personification of inanimate objects helps to break down barriers present between humans and non-humans. In voicing their unique concerns, fears and motivations, the objects are permitted to communicate from their perspective, emancipating them from binds of inanimateness. In the propositional video *Brad the Toaster* (Rebaudengo, 2012) this tactic was used as we see the fictional scenario of a toaster empowered, via an internet connection and sensors, to determine when he is not being used enough – a scenario that will result in Brad being re-homed somewhere more appropriate. This ‘thinking object’ approach to storytelling provides a biography of ‘things’, uncovering the secret life of the everyday objects that fill our lives. This type of storytelling employs a very powerful approach as it does what others don’t—it gives life and meaning as it transforms the everyday *thing* into *some-thing*. It invites the viewer into a fantasy world where mobile phones have thoughts and feelings, where toasters don’t like being neglected and where the human is no longer the central being.

In this example, storytelling is leveraged as a platform for engagement, rather than delivering information. ‘Objects’ are brought to life, made relatable, and imbued with agency and self-determination—implicating and activating the audience through the sharing of ideas and experiences.

This method achieves much, for example, when giving a presentation, the inclusion of a range of stories and gamified challenges incorporated into the narrative, work to encourage the audience to participate in the construction of new meaning. Re-tellable stories, fun facts and mythbusting create units of currency in the form of information that can be shared and amplified. During Performative Presentations, allowing the flexibility and randomness of storytelling to emerge through narrative experiences or jokes, diverges from the main story creating a collective confidence and breaking down of the barriers of dialectical 'information transfer' that is the traditionally constructed role of informer and receiver.

This is participatory communication for social change as discussed by Servaes et al. (1996) who argues that structural change requires the redistribution of power. Given that communication is interested in the dissemination of meanings, the emphasis on communication should be on information exchange rather than persuasion (Servaes et al., 1996).

Another storytelling approach employed, is that of *proposition*, whereby the narrative reframes possibility through a divergent lens. For example, the *E-waste Autopsy* narrative proposes items that are not designed to be recycled, they could be designed better and this proposition is embodied in the experience of dissecting the product and through the meta narrative that evolves from the discursive act surrounding the project. Similarly, this tactic of collaborative ad hoc narrative generation was employed through the *Repair Workshops* and to a degree with the animations in the *SLOT* series. The latter uses propositions in a different way to the Interactive Installations, in that they fictionally propose possibilities, and these same propositions are brought to life in the TED talk. As the narrative proposes—or in this case challenges—for alternative ways of addressing issues of food waste, electronic product design and deconstructing the role of consumerism in sustainability.

Storytelling is fundamental to communication, and all communicative content is essentially conveying narratives in diverse ways. By exploring a mix of fictional and non-fictional narratives, it invests the audience with the possibility of change. Propositions require a level of fictionalisation, whereas the non-fiction narratives—the stories of experience and examples—allow the audience to relate, and potentially adopt the narratives themselves.

The criticality of storytelling can be seen through the 'linguistic turn' across social science (A. Brown, Y. Gabriel, & S. Gherardi, 2009) where narratives and stories, specifically those linked to their role in communication, knowledge, sensemaking, power and identities, have given rise to increased levels of narrative based inquiry (ibid). For Gabriel (2000) "Storytelling is an art of weaving, of constructing, the product of intimate knowledge" (p.1) yet it is also ambiguous in its role academically. Indeed humans are 'storytelling animals' whereby one's reality is made up of a series

of stories—yet there is a distinct difference between a fictional and a non-fictional account of reality.

The relationship between storytelling and change has been frequently observed by authors such as Carr (1986); Humphreys and Brown (2008), and Barry and Elmes (1997) who explore the relation to notions of temporality, preoccupied with describing and understanding the complicated processes in which multiple agents, characters and contexts interweave and overlap, often in uncertain and ambiguous ways (A. D. Brown, Y. Gabriel, & S. Gherardi, 2009). Change-making narratives propose an alternative to the status quo of dominant un-sustainable practices through the construction of alternative possibilities; practices can be influenced through the propositions of agents acting divergently or through the framing of new conversations.

Of particular interest to this practice is that historically, stories have been the interest of mythologists, and that the specific use of stories in the context of this practice is to deconstruct dominant ‘green’ myths through the constructed use of re-framing narratives. In the concept of stories as folklore, the role has traditionally been one of entertainment, as performance—this indeed is the role in which narrative is employed in the Performative Presentations discussed within this PhD—where the act of performance carries throughout all the projects as they seek to accomplish the agenda of making change.

Storytelling is a carefully curated tactic, installed in ways that seek to poach power and dislocate dominant myths and ideologies that prevent change. Stories have an essence of ‘stickiness’ (Heath & Heath, 2007) as they cling to our minds and often reappear at some point in the future. This ‘plasticity’, as described by Gabriel (2000) means that the audiences to stories are in themselves potential storytellers—they disseminate the story. In a contemporary context this is evidenced through the ways in which people ‘share’ and ‘like’ narrative-rich content in online environments (J. Yang & Leskovec, 2011). This transferability is exactly what this tactic of storytelling is seeking to obtain. By operating as an agent of engagement, and a vehicle for generating exchange, storytelling works like a virus that seeks to be transferred between hosts, this ‘meme’ (Dawkins, 1997) seeking method forms part of the change-making tapestry that enables a practice to translate and transfer change.

5.2.3 Playing

All of the Tactics can embody playfulness, yet as a tactical approach to effecting change; play is employed as a mechanism for engagement, to increase and activate participation as well as to promote educative knowledge transfer. Play consists of actions and ideas, the generation of positive pleasures that make it possible for humans to deal with everyday existence (Sutton-Smith, 2009).

Nevertheless, “play appears to be one of those constructs that is obvious at the tacit level but extremely difficult to articulate in concrete terms—we all know it when we see it or experience it. Its definition can also be culturally and politically constrained” (Rieber, 1996, p. 44).

The important role that play holds in developing and enhancing creative thinking and problem solving skills has been explored by Pepler and Ross (1981), Vandenberg (1980) and by Berretta and Privette (1990). Further to this, Kolb (1981, 1984) explores the benefits of experience based learning and how play can create deeper educative outcomes (Kolb & Kolb, 2010). Incorporating playfulness into knowledge transfer allows for the transformation of any environment into one that is more stimulating, entertaining and enjoyable (Barnett, 2007).

All The Projects explored herein employ variations of play, testing the role that playing has in actively implicating one in the learning experience, and the opportunities for utilising play as part of a change-making practice. Aside from this tactical role, play has also been used as a method for reflective practice within the PhD process itself, developing and utilising games and play devices employed as a way of dissecting, understanding and arranging core elements of the practice, throughout the research process.

The *PhD Exploration Cards*, were one such tool that consisted of a series of probing questions such as: ‘How would you describe your practice to a stranger?’ and ‘Who are the main beneficiaries of your work?’ Along with the time tokens, play involved quick firing of responses and audio recording of these for later reflection. Through this process, aspects of this practice were uncovered which were not initially obvious. There were strong themes and approaches that emerged and were unlocked through play. These early experiments evolved into the *Design Play Cards* and other concepts of play-based implications.

Sutton-Smith (1966, 2009), who has written extensively on the topic, concludes that play is a *viability variable*—a technique that allows us to overcome life’s disasters and distress. For Piaget (1962) and Nicolopoulou (1993), play is fundamental to human development and socialisation. Yet playfulness is an undervalued human asset that “(...) seems to be something you have to give up when you grow up” (Provost, 1990 in Rieber, 1996, p. 43). This position of play being sidelined to something one does only in youth, is being challenged by the contemporary introduction of playfulness and gaming into everyday life through apps and gamified user experiences.

Gamification (Deterding et al., 2011) facilitates experiences that build adventure (Schell, 2008) and an “(...) experiential understanding of real world issues through play” (Swain, 2007, p. 805). According to Lazzaro (2004) “People play games to change or structure their internal experiences” (p. 7), and in a study exploring the emotional component of game play, Lazzaro found that people

play because they desire the challenge, which creates both frustration and joy; where people experience visceral, behavioural and cognitive changes through the act of game play. Interestingly, she found that group play triggered more emotions than single player games, indicating the higher level of reward and experience obtained through group play.

These approaches are built upon through the game-based projects experimented with herein. During group activities, such as the *Design Play Days* and the *E-Waste Autopsy*. I witnessed the increased state of engagement discussed by Lazzaro, with the time and challenge parameters of the *Design Play Days* creating a hyped environment that increased visceral experience through play. This anecdotal evidence was compounded by witnessing similar (yet more subtle) versions of an increase in participant engagement throughout the *E-waste Autopsy* Project. In the latter case, people were surprised by the experience, and the collective nature of the activity created a communal understanding. People were displaying shock at how difficult it was to get these products apart, lamenting how many different components there were, and concluding how unlikely it would be that they would be recycled due to this, all while enjoying the act of playing through disassembly. The play arena allowed for collaborative learning that was not prescribed, but organically evolved through the agents participating.

Furthermore, in considering ways of incorporating pro-sustainability into the heuristic decision making process of designers, in part, through the use of play, projects such as the *Design Play Cards*, the *Mythbusting App*, the *Design Play Days* and *Game Changer Game*, are all contemporary reinterpretations of play-based learning and divergent educative experiences. However the methods of play employed in the tools are open to interpretation by the educator/user/participant. The intention of these play-based experiences is to be enabling, and to subliminally instil knowledge through experiences elicited within the act of creative play, based on the concepts proposed by Kolb. Similar contemporary examples to these projects include, *The Design Heuristics* card deck (Heuristics, 2012) which seek to encourage ideation and problem solving akin to the ways in which *The Design Play Cards* do. Utilising established 'method card systems' is also employed by the *Design with Intent Toolkit* (Lockton, Harrison, & Stanton, 2010) and the *IDEO Method Cards* (IDEO, 2003). These all leverage a heuristic approach to creative problem-solving and serve as design communication tools (Wölfel & Merritt, 2013).

Through the exploration of play within this practice, it has become obvious that the mechanics of play are so well entrenched in both children and adults that they are easily adaptable and transferable to a range of engagement techniques. Children have a natural predisposition to playfulness (Sutton-Smith, 2009), and projects such as *The Design Play Days*, *The Design Play Cards*, *Game Changer Game* and components of *The Secret Life of Things*, harness this predisposition. The

use of play, as a more covert tactic was explored and specifically applied to engaging adults through the *Game Changer Game*, *E-waste Autopsy* and the *Repair Workshops*, and through the use of humour and interactivity, in the performative presentations, playfulness is used to integrate interactivity as a platform for engagement and implication.

Drawing on play mechanics to develop engagement platforms is an area that this practice is dedicated to exploring further, particularly within the scope of designing social change interventions and change-focused communication projects. The case study presented by the *Fun Theory* (Volkswagon, 2009), whereby behaviour change is enacted through fun based interventions, shows the opportunities for utilising fun and play as a framework for motivating human behaviours and influencing change outcomes. Mescall (2012) writes of the tactics of cuteness and humour he used to make the viral video *Dumb Ways to Die* 'funny and likable,'³⁹ and there are many other examples of how play is being implicated as a change-making mechanism⁴⁰.

5.3 DISRUPTIVE DESIGN PRACTICE

Through these practice explorations, I have become attuned to the sociological and systems foundation of my practice, specifically the process of designing disruptive interventions. The Projects have allowed for in-practice reflections to evolve ways of operating tactically, but more so, through this experimental testing ground, I have been able to empower a practice of intentional change. Testing and exploring different modes, methods and mediums that have been implemented whilst enacting this agenda-driven practice. From this, a Disruptive Design Practice has been formed, incorporating these tactical ways of operating and allowing for a distillation of a process that I use in order to design disruptive interventions into existing systems, in order to leverage positive social change outcomes.

The sociological approaches employed have allowed an understanding of the ways in which economies, people, and the processes by which society operates, can develop into a practice of systems exploration, and problem identification that enables this praxis to achieve its Theory of Change. From this an action oriented design process is applied in order to develop an intervention (Project) for an identified 'gap' within the system. Each Project is enacted within a 'system boundary' such as education or the communication of sustainability in design. Outside of the system boundaries

³⁹ Further explorations and case studies into the use of play as a mode of activating engagement are provided by: Baid and Lambert (2010) Blythe, Overbeeke, Monk, and Wright (2004) and Overbeeke, Djajadiningrat, Hummels, Wensveen, and Prens (2005).

⁴⁰ For example, there is The Institute of Play, Games for Change, Games for Good, the fields of serious games (Michael & Chen, 2005), persuasive games (Bogost, 2007), in teaching (Kapp, 2012), and games for social change (Swain, 2007).

lie the practice's agenda of effecting change in amplifiable, adaptable and enabling ways. This process of interventionist design moves through a rapid and iterative prototyping phase of real-world testing and iteration before being fully implemented as a Project proposition. Once in existence, I then dynamically respond to the constraints and opportunities that the intervention has bred and evolve this into the next iteration, creating an evolving in-action process of intent through disruptive design propositions.

This practice process differs from existing design methods by seeking to embed actions and designed artefacts within a systems thinking framework and splitting the process into two distinct areas of 'mining down' and 'building up'; using the initial mining and exploration phase to create the foundations from which the design interventions are built. This systems approach allows me to develop an intimate relationship with the arenas within which I am seeking to intervene, and secondly, allows for iterative dynamic evolution of the products of practice, as the landscape is defined through the system boundary and the relationships between connected components is framed through the initial exploration phase. From this, the 'building up' of Projects is facilitated by iterative ideation and research with stakeholders, and in some cases this is through direct conversational research, others ethnographic, and in many cases involves playtesting. Effect is then measured empirically through experiences with the participants. A shorter description of this process would be: systems analysis through mapping and opportunity identification, research, ideation, testing, iteration, and implementation. Reflection-in-action occurs throughout these iterative processes.

This process of designing interventions is iterative and constantly evolving. This can best be evidenced through the in-practice experience of the Educational Tools. The *Secret Life of Things* project was born out of an analysis of the education system as a response to the experience of participating in it as both student and as an educator. I allowed the opportunity analysis to breed into a phase of research and ideation, which then evolved the idea of a fun-framed animation series. It was then designed, tested and implemented through the tactical use of storytelling and challenge. Once implemented, the reflective process involved incorporating feedback from other practitioners and empirical data along with the use of surveys and anecdotal evaluations, this allowed for impact to be explored and the iteration of the next intervention in the form of the *Mythbusting App*. The App was an adaptation of one of the challenge-based games included in the educational resources – The Production Game. Reflection-in-action allowed for these two projects to evolve into the Design Play Cards, this time working off the successes of small transferable pieces of information that could be manoeuvred in different ways.

The *Design Play Cards* and *Mythbusting App* experiences allowed for the evolution of the *Good Design Guide*, combining both online interactive experiences and transferable chunks of information. Looking at these projects in relation to the Theory of Change, it can be seen that the objective to effect change in others' practices was enacted through the testing of new tools that employed tactical ways of operating. Each of these projects has resulted in a considerable amount of email communication from other practitioners detailing use.

The Interactive Installations also went through a process of evolution based on this iterative cycle of designing disruptive interventions. The opportunity to enact Platform 21's Repair Manifesto as a project allowed for a mapping of the repair landscape in Australia. I then designed an intervention adapted from the projects I had seen before, but collaboratively formulated in dynamic response to the funding opportunities—these opportunist design processes gave life to the project and helped it increase in size and reach. Testing occurred in implementation with the collaborators and participants from the public, as is so often the case with live performance. Reflection on this Project experience drew many conclusions, such as the power of allowance in participation, the role of media leveraging and the dynamic outcomes of multi-stakeholder collaborations. I learnt most significantly that people respond to connections, reward and play. This project allowed the public to come and play through participation and this was a powerful tactic that started to permeate many other areas of my work. As a result of this reflection, this project evolved into the *E-waste Autopsy* and *Design Play Days*. I also started to integrate play and implication into presentations and other live performative projects.

Speaking of allowance, this reflective practice based PhD research has allowed me to adopt strong linguistic framing—that of the disrupter, the provocateur, and the intervener—with intent. This adaptation has empowered my work through a poaching of power from those that have appropriated these terms. In doing so, I have sought to create a personal narrative of practice that opts into the linguistic frames of rebellion, provocation and change.

5.4 CHAPTER 5 - CONCLUSION

Reflecting on the deployment and position of the tactics and Practice processes discussed within this chapter, has allowed for a deeper understanding of the ways in which this practice supports and evolves through its propositions. A subject of critical importance to this approach is the embodied position a practitioner employs when required to facilitate, instigate and propose change. It is one thing to use tactical ways of operating and another to embody the appropriate and planned use of these Tactics. To this end, the use of these defined Tactics and Practice methods is entirely personal, their power and purpose evolving through the agenda to effect positive social change.

The disruptive act of challenging the systems within which one operates, the status quo, people and their perceptions, is defiant and all-consuming in its embodiment. Demonstrated in this chapter is how the in-action experimentation of change through the Projects led to the distillation of three tactics of operation and the articulation of a Process of practice, developed to facilitate the practice agenda. Through this, the research question has been addressed, the result: a proposition of tactical ways of operating within a Disruptive Design Practice.

6. THE CONCLUSION

6.1 OVERVIEW

The main aim of this research has been to discover, through in-practice explorations, how one can enact an agenda to effect positive social change through and with their practice. The Theory of Change outlined in Section 2.4 frames the core objective of increasing the uptake of sustainability in design through the creation of project-based interventions. This exegesis presents and demonstrates the formation of a transdisciplinary practice that employs tactical ways of operating through an intentionally disruptive design practice.

Chapter 1 of this exegesis provided an overview of the PhD research, setting the context, methodology and research agenda. Chapter 2 set the context within which this work is positioned and framed; that being a contribution to, and experimentation with, methods of communicating and enabling pro-sustainability change in and through design practice. From this position, the historical development of sustainability in design was explored and the significance of this research in contributing divergent methods of practicing design for sustainability is outlined in Chapter 3, through an exploration of the theoretical underpinnings from which understanding and approaches are drawn.

Designed disruptive interventions have facilitated a range of Projects developed and performed through this work while Chapter 4 provides an examination of these. The Projects served as the vehicle for reflective actions, allowing the outcomes of tactical ways of operating within a Disruptive Design Practice to evolve, as discussed in Chapter 5. Throughout this PhD exploration, there has been an evolution of practice approaches, tools, methods and processes that have enabled and empowered the distillation of this body of work into a divergent and intentionally disruptive practice framework.

This final chapter provides the conclusions of the research and how it has addressed the research question and defines the contribution to new knowledge that this PhD has developed.

6.2 ADDRESSING THE RESEARCH QUESTION

In answering the research question of how pro-sustainability change can be enacted through an agenda-led design practice, a range of inquiry methods were developed through the action

research process. This allowed for an exploration and distillation of the methods in which tactical ways of practicing the act of change-making could contribute to the field of sustainability in design. This resulted in a series of experimental projects including games, presentations, books, apps, and installations conducted over a three-year period. These projects formed the designed interventions into education and communication systems, and explored different methods and arenas of practicing. Concluding in the articulation of tactical ways of operating within a Disruptive Design Practice as a propositional opportunity for divergent modes of practicing pro-sustainability design.

The discussion and position of the historical development of sustainable design methods presented in section 2.6 demonstrates that in part, one of the issues with uptake of approaches lies within the traditional model through which sustainability has been framed and communicated. Whilst there have been several successful propositions regarding modes of practicing that embrace social and environmental considerations, this research has demonstrated that there is relevance and scope for a re-framing through divergent tactical ways of practicing that legitimise a pro-sustainability approach to praxis, encompassing disruptive and tactical modes of operating to challenge the status quo.

Certainly, this realisation and nuanced understanding has fundamentally shifted the approach taken in constructing and enacting my own change-making practice. Being empowered through the distillation of these systems of articulating and enacting ways of operating has in large part formed a new type of practice—one that is constructed through an agenda to effect change and enacted through activated experiences. That is how this work has addressed the research inquiry—through the formation of contemporary propositions for value driven practices that embody tactical ways of constructing and encountering the social and environmental conditions within which we must all operate as designers and as consumers of products and services. The outcome of the research has bred the distillation of a tactically Disruptive Design Practice.

Further to this, approaches into experiential education and educative knowledge transfer were explored based on the works of Freire (2000) and Kolb (1984). This exploration was shown to allow for the testing of experimental and experiential learning tactics of challenging, storytelling and playing. Through this, the Projects explored the use of positive message framing and action oriented communication strategies; all leading to a core practice of utilising tactical ways of operating formed through a bricolage of available resources.

6.3 CONTRIBUTION TO NEW KNOWLEDGE

This research has been pursued through an experimental and agenda-driven approach to change-making resulting in the proposition of a Disruptive Design Practice embodied by the researcher with the intent of contributing a case study of new methods in practicing pro-sustainability change through design. Born from the Project-based explorations, the tactical ways of operating enabled the advancement of this practice. These Tactics form part of a redirective (Fry, 2009) practice, that incorporates a systems thinking approach to design production. The tactical ways of operating aid in the enactment of the Theory of Change and the modes of experimenting through disruptive interventions allow for the testing of divergent methods of developing communicative, performative and educative tools. To this end, the contribution to knowledge has been evidenced through an ability to draw together a number of disparate schools of thought, disciplines, and methods of enacting change into a new way of practicing through the tactical deployment of systems interventions that seek to advance the uptake of pro-sustainability change.

This work builds on provocations for practice changes put forth over three decades ago by Papanek regarding the profound and direct influence of design on society and the environment; “The design response must be positive and unifying. Design must be the bridge between human needs, culture and ecology” (Papanek, 1985, p. 29). Design must in essence be constantly evolving in dynamic response to the conditions within which it is operating. Fry’s call for ‘redirective’ practice builds on the idea of dynamic design (Fry, 2009) and this work builds on these alternative socially and environmentally motivated design paradigms by presenting disruptive and intentionally constructed modes of practicing with the active development and enactment of interventions to generate pro-sustainability change.

In essence, this proposition is about shifting the designer from social influencer, to designer as intentional change agent. This method fosters adaptive and resilient qualities in approaching design practice so as to enable a more considered engagement in contending with competing interests and intractable problems. From this perspective, operating as an interventionist who seeks to disrupt the status quo through tactical ways of operating within their praxis fosters an increased ability to respond, to adapt, to amplify and to contribute through the embracing of responsibility and influence within design and the wider community.

6.4 LIMITATIONS AND FUTURE DIRECTIONS OF THIS RESEARCH

This research, having been conducted through reflective action research has allowed for reflection in and on practice, resulting in propositions of tactical ways of enacting a disruptive practice to

effect positive change. It has not however, allowed for any research into the effectiveness of such approaches in relation to achieving change outcomes. The intent with this particular body of work was to experiment with disruptive and divergent means of effecting change through a transdisciplinary design practice. To this end, it intentionally avoided the testing of effect, and thus has left scope for such approaches to be tested and analysed with more detail in future research. Such research was conducted during the first *Secret Life of Things* animation (Acaroglu, Ladds, et al., 2011), yet given the methodological framework of this research has been through reflective action, the further analysis of success factors in the designed interventions was excluded. Future research will involve in-practice testing of the application of tactical approaches for their effectiveness in increasing uptake of pro-sustainability in education and design practice.

The provocations here build on a broader discourse of the role of design in society as influencer and former of social practices, as well as the resulting opportunities that are present in the act of intentionally seeking to disrupt the status quo through design. Thus there is scope for encouraging further exploration of divergent practice methods that draw from and transverse several arenas of theory and practice to engage with activating avenues for pro-sustainability change.

It is hoped and intended that the contributions detailed within this PhD, such as the framing of a tactical and Disruptive Design Practice, can contribute to the adaptation of emergent pro-sustainability change-based communities of practice.

6.5 EXPERIENCE AND CHANGE

Throughout this body of work, it has been argued that it is through experience that one gains intrinsic knowledge that generates further interest in how activated interventions can be used to legitimise a social agent's participation in the active construction of new pro-sustainability meanings. Experience has driven these Projects, fuelled the agenda, and is what I am seeking to create for others—transformative experiences.

Experiences are the glue that binds the disparate parts of this account. I publicly represent what I seek to embody, and this document is an account of real experiences in the world that attempt to make change. Experience fuels my passion and experience is what seeds the next project and the one after that. Learning from experience challenges the status quo on how learning exists (Boud, Cohen, & Walker, 1993), and through this playful challenging and shifting of experience, the stories created go on to operate as agents of positive change in the world by themselves—if they could talk they could tell their own story of experience.

The process of this reflective action research incorporated several personal change experiences that evolved both my professional approaches to practice. The acknowledgement that challenge was a major driver—that I seek out personal challenges, set the rules, and define the objectives and the rewards—meant that I gained a deeper insight into this process via reflection. Through this process I have been able to start refining challenge as a critical tactic in my change-making agenda. Secondly, by acknowledging the rebellious streak inherent within me for most of my life, it has allowed for a certain honing and focusing of this characteristic as part of a conscious habitus. Moving forward, this is a method of practice I wish to celebrate, nurture and support in others.

Critical reflection is now an ingrained part of my analytical and creative practice: I can't undo what I have learned in the past few years, and the skills acquired herein are being put to use in current and future acts of intervention. Acknowledging that all presentations are performances has also been greatly empowering to my practice of public presentations and is fostering a desire to test and experiment more within the performative role. The multiple layers of experience within this practice process has created change for me, increased my agency, enabled me to more consciously define the arenas in which I operate, and has empowered me to embrace change more holistically. Investigating and understanding the structures of academia and the significance of the work I do has also reaffirmed my position on the requirement for these intentionally disruptive and divergent approaches to acquiring, disseminating, and fostering the discovery of new knowledge. As a result of these experiences, I intend to continue to build on these methods and experiment with divergent practice modes of operating that facilitate the agenda of participatory pro-sustainability change through design.

7. BIBLIOGRAPHY

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APPENDIX 1: RESEARCH CONDUCTED AT START OF PHD

Overview

At the start of this PhD, process ethics clearance (Ethics Register Number CHEAN A-2000562-08/11) was obtained for interviews with recent design graduates, practitioners and educators in order to explore the reasons why pro-sustainability change was or was not being integrated into design practice. The interviews were conducted as face-to-face qualitative interviews as well as email questionnaires.

The findings from the interviews was presented at the 2012 Agideas International Research Conference: Design as a Strategic Resource: Adding Value to Business and Industry, and a co-authored paper (Acaroglu & Fennessy, 2012) titled: “Rapid Adjustments Required: How Australian Design Might Contend with a Carbon Constrained Economy” was published as part of the proceedings.

Methodology

In-depth qualitative interviews were conducted with 24 recent graduates, experienced designers, directors of design companies, design educators, design managers in the internal design departments of manufacturing enterprises, freelance designers and small design business owners. Topics covered in these interviews range from: the motivations for becoming a designer; the role of design in society; the currency of design education curricula and the experience of design for sustainability through formal education and through professional practice; the perception of barriers to engaging with sustainability within design practice; the opportunities for change; and, the readiness of the design industry to respond to legislative change.

This research was explorative in nature, and whilst an interview framework was used, participants were asked to respond in whatever ways they felt befitted within their experiences. This allowed for more personal responses to be captured. As described by Kvale (1996), the main task in interviewing for qualitative research is to understand the meanings (explicit and implicit) of what the interviewees say. Using a general interview guide approach, participants were asked to provide responses to topics related to their experiences regarding the obstacles to, and opportunities for, integrating sustainability into their practice of design. Interviews were conducted in a mix of one-on-one and focus group situations.

While the number of interviewees represents a very small sample of the total involved in industrial design consultancies nationwide, care was taken to recruit participants from a range of business types to give adequate representation. The responses gathered were analysed and grouped by recurring themes and respondent types. Due to the conversational nature of the interview technique the authors are conscious of the inclusion of other factors in the ways in which participants chose to respond, and effort has been made in the reporting to attend to this. Thus, the paper presents selected statements of those interviewed with reference to literature in the field to illustrate common themes.

Key Findings

Despite being familiar with the underlying concepts of design for sustainability many of the more senior design professionals interviewed reported not actively practicing with eco-design strategies. The reasons for this varied from: Clients not asking, or not knowing how to ask; to the imposition that additional accountability would place on their creative process, were identified as key issues.

One interviewee said “Even if I design a green product that is innovative, the bean counters that run the companies won’t send it to market unless they can see a return on investment in 3 – 5 years”

Further to this, clients were frequently identified as a major and external obstacle to change. One recent graduate said of their experience with clients “There are the clients that actually want to make a difference and clients that just want to make money and in the middle there is a hybrid of the two”. Despite feeling capable of delivering clients more environmentally considered design solutions, whether through recent education or through on-the-job learning, it was overwhelmingly expressed that there simply isn’t enough demand for this type of design service from clients and therefore it is not initiated.

One of the consultancies interviewed offered a “sustainable design service” that they attempt to integrate into the research phase of each product design project, but found it difficult to get any traction with clients: “The harsh reality is that it’s completely the clients call – we are doing projects at the moment that are all about cost, cost, cost” and, “Categorically I have never been asked to design a sustainable product”. One designer said “We need to know not just how to do eco-design but how to sell it to our clients”.

The story that emerges from many of the interviews is that the designers, whether skilled or not in eco-design, simply do not know how to sell it to their clients or to their colleagues and managers as a value adding service. When asked what would assist in overcoming these barriers, many of the designers interviewed wanted access to more resources, especially information on materials and processes deemed to be ‘sustainable’.

Many of the graduates interviewed were quite skilled in eco-design strategies and talked of wanting to use their design knowledge and skills to affect change, however this was often not part of their experience in professional practice. Many talked of how, when they were at university there was time to think through social and environmental issues and research them, but on the job, the situation was quite different. Commercial pressures and constraints dominate, time is scarce, and they are constantly required to learn new skills:

The hardest thing is knowing how to identify when and how you can present this type of information to the business... You have to be a strong enough person to be able to instigate that change otherwise you become a victim to the culture in an office space,...you often feel that you need to do what they [employers] think is best – you have to be upfront and honest about it to get it into a business.

Tensions were also articulated by more senior designers where a disjunct between personal values of design for sustainability and the reactive and often conservative business cultures of consultancy environments were conveyed. Industrial design consultancies were described by many interviewed as being very hierarchical, making it difficult for employees starting out, or midway through their

careers, to instigate change towards greater inclusion of sustainability within their organizations. It was also evident that the responsibility for enacting change is deflected up through the professional hierarchy, where: graduates seek leadership from their design managers; managers expect their employers and the representatives of their professional associations to make a mandate for change; and, where those in higher positions deflect responsibility back to broader industry and government regulation.

The engagement with sustainability in design education for a recent graduate had:

Certainly empowered me and made me feel as if it was appropriate that I should be engaged with these issues and be concerned about them, but since heading out into industry I mean, frankly you don't have the time or the energy, it's not there, I feel like it has to come from the top down.

The design managers interviewed also felt that there needed to be a top-down pressure from the employers and professional leaders (referred to by one interviewee as the 'design masters') within the industry. A senior design manager said of this:

That's just not going to happen as we [design consultancies] are all in competition with each other, it would be great if we could all get together and set the agenda, but at the end of the day we are running a business and we are in competition.

There appears to be a paucity of leadership in the valuing of sustainability that is evident in the voices of those interviewed, where sustainability is not seen as a business imperative for design and is perhaps in some ways seen as antithetic to commercial design practice. Design has long been the locale for the construction and proposition of ideals like sustainability however, where there is a reticence to utilise, value or even challenge these ideals within professional practice the particular agency within which this idealism may be transferred into 'real-world' practice fades. Ultimately this may undermine the ability of designers to transfer and adapt current and potentially critical design knowledge into business settings for the benefit of business. If, as the voices from practice might suggest, that design for sustainability is perhaps only really practiced when it is either externally mandated by policy, or when it is explicitly paid for, there are real challenges for the effective integration of environmental concern into design business.

APPENDIX 2: TACTICS EMPLOYED IN THE PROJECTS

Educational Tools			Tactics employed		
Project	Components	Overview	Challenging	Storytelling	Playing
The Secret Life of Things 2010- 2014	<ul style="list-style-type: none"> ▪ Animation 1: <i>Life Psychology</i> (2010) ▪ Animation 2: <i>This is Your Life Cycle</i> (2013) ▪ Animation 3: <i>It's the Little Things</i> (2014) ▪ The Production Game PDF quiz style game ▪ Educational Resources in multitude of formats ▪ Website resources ▪ All are published online under creative commons licence, available free 	A multifaceted education project based around a series of short animations exploring critical ideas of eco-design, life cycle thinking and designer's role. Including curriculum support materials such as: fact sheets, games, activities and presentations.	Re-framing Proposing Agitating Actioning	Personifying Fictioning Animating Performing	Gamifying Enacting Implicating Engaging Humouring
The Design Play Cards 2013	<ul style="list-style-type: none"> ▪ Deck of 50 cards used in educational settings ▪ Available as free DIY print and play set as well as professionally produced full deck 	Card game designed for use in challenging creative problem solving through sustainability. Arranged in 3 sections; <i>design problems</i> present issues that need solving; <i>design strategies</i> detail a range of social and environmentally responsible design approaches; and <i>design inspiration</i> , examples of real world solutions that have been implemented. Multifunctional methods of play and published under creative commons	Re-framing Participating	Demystifying Deconstructing Demonstrating	Gamifying Enacting Engaging
Good Design Guide 2014	<ul style="list-style-type: none"> ▪ An interactive e-book designed for use in educational settings ▪ Also published as a hard cover reference book 	A interactive PDF and hard cover book for use in secondary and early higher education design that is designed on non-linear learning principles of free exploration and self-directed navigation	Communicating Re-framing	Solutioning Propositioning Stimulating	Engaging Inspiring Activating

Performative Presentations			Tactics employed		
Project	Components	Overview	Challenging	Storytelling	Playing
TED Talks 2012-2013	<ul style="list-style-type: none"> ▪ 6 minute TEDx talk in Sydney ▪ 18 minute TED2013 Talk Longbeach ▪ 18 minute TEDx Melbourne talk 	Design and development of short curated talks for presentation at high profile TED events. Are all published online so have a multidimensional nature to how they exist in the world	Propositing	Mythbusting	Implicating
			Re-framing	Personifying	Performing
			Provoking		Puzzling
AIGA Talk 2013	<ul style="list-style-type: none"> ▪ 20 Minute AIGA Minneapolis Talk 	Designed funny 20 minute public presentation on the opportunity for sustainability in design practice for key note at international design conference	Engaging	Mythbusting	Humouring
			Propositioning	Performing	Implicating
			Re-framing	Stimulating	Participating
Interactive Installations			Tactics employed		
Project	Component	Overview	Challenging	Storytelling	Playing
The Repair Workshops 2011	Two part interactive exhibition – generation of repaired works for exhibition and free repair sessions for general public	Week long collaborative project whereby designers/artists were paired with scientist/engineers to repair broken household items that went into an exhibition and live auction. The second part involved 2 days of free repair sessions for the general public.	Repairing	Fictioning	Collaborating
			Designing	Propositioning	Inviting
			Participating	Creating	Engaging
					Implicating
					Making
E-waste autopsy 2014	One off half day instillation in the Community Hall at NGV exploring e-waste	A publicly performed interactive installation whereby members of the public are invited to participate in a dissection of e-waste.	Propositioning	Deconstructing	Engaging
			Engaging		Implicating
			Participating		Making
Design Play Days 2013-2014	3 x design play days with a total of 200 school children held in the Great Hall at the NGV	A series of curated interactive education sessions with school students whereby they are challenged to solve design problems through play and interactivity.	Problem- solving	Creating	Competing
			Educating	Constructing	Collaborating
			Solving		Engaging
					Participating

Gamification			Tactics employed		
Project	Component	Overview	Challenging	Storytelling	Playing
Myth-busting Sustainability App 2011	<ul style="list-style-type: none"> ▪ IOS game based application ▪ Freely available for download ▪ 50 multiple choice questions ▪ Mini-game 	A game based app designed for iPhones that challenges the player to answer multiple choice questions about sustainability issues that have counterintuitive answers based on best practice science. There is a fun mini-game that is unlocked after every 3 questions, this was designed to serve as an extra motivator.	Mythbusting	Puzzling	Gamifying
			Engaging		Solving
Game Changer Game 2014	<ul style="list-style-type: none"> ▪ An interactive game based campaign development and ideation tool ▪ Available as professionally produced full deck 	A printed game that presents an array of approaches, personas and examples of innovative communication techniques for effecting change designed to be used by change agents in campaign development.	Problem-solving	Fictioning	Gamifying
			Agitating	Explaining	Implicating
			Re-framing	Demonstrating	Participating
					Competing