DE\textsuperscript{Q}

A Triptych of Designed Objects, which explore the relationship between Text and Artefact, Theory and Practice

Thesis
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Dedication

This thesis is dedicated to the memory of my father

Lyell Rivers Dickinson

27\textsuperscript{th} November 1932 to 30\textsuperscript{th} July 1978
Abstract

Abstract

DE^Q

A triptych of designed objects, which explore the relationship between theory and practice

DE^Q can be thought of as a logo for the research. It is not meant to be directly interpreted as an equation, rather as a thought provoking visual statement “Design = Energy to the power of Q the question asked”. This visual statement refers to the theorising of Dilnot (1999) and Jonas (2000) who argue that the domain of design is ‘artefact’ centric, positioned in one corner of a triangular model of knowledge creation (Archer, 1979). The other two corners of Archer’s triangle are occupied by the humanities, which use ‘words’ in one corner and the sciences, which uses ‘numbers’ in the other. In their theorising, design occupies the third corner and uses artefacts as its major form of communication.

DE^Q is an artefact. A symbolic representation of the research but how does it communicate? How does any artefact communicate? This research undertakes a process, which aims to reveal the ‘silent language’ of design through a systemised analysis of the three artefacts designed for this study. Each design will have at least the nominal functionality of a source of lighting but they (both individually and as a set) will be more. Their real purpose is to reveal the logos of the logo. They facilitate a discourse on the relationship between theory and practice. They probe the relationship between text and artefact, and they are examples of artefacts designed from, for and of questions.

To achieve this, a review of seminal thinkers in design theory was undertaken which identifies a heart of darkness at the core of the relationship between theory and practice. This is followed by a short review of education literature to uncover if the heart of darkness phenomena has implications in Design domain educational settings.

As a result of the review a research plan was formulated which utilises a mixture of practice led and case study methodologies to further the exploration of the relationship between the

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1 Logo: An emblem or device used as a badge or symbolic representation of an organisation or company.

2 Logos: (Greek) The word by which the inward thought is expressed, the inward thought itself. Used as a term in philosophy, rhetoric and religion it is most often used with the implication of a universal operative principle.
text and artefact through the imposing of an experimental context to the undertaking of three designs, which are nominally lights.

The experimental parameters developed as the study progresses were:

- Artefact before text
- Text before artefact
- Text and artefact in unison

How this could be achieved was not known at the start of the research and its success in many respects is for the reader to judge. But the experiment was undertaken and the results set out in this document.

That the designs were lights was not an arbitrary decision. The intrinsic nature of the function of lighting complements the study and is highly symbolic of the research intent. To illuminate that which cannot be seen, that which was not known. Structurally the light parameter provides the intellectual focus and the constraints required to allow the act of design to take place. The procedure for undertaking the three individual designs is set out below.

The first light can be viewed as a control. It follows a relatively standard approach within design practice. The artefact itself was the focus, generated out of a desire to create, with the analysis of the object being a post analyses. Not so typically this post analysis utilises the literary style of story telling to expose the now silent message embedded in the artefacts creation but post analysis of artefacts in its many text centric forms is highly typical within design.

The second case study was a design undertaken after the recording of an experience in the form of a text-based document. This is in contrast to the method of design utilised for the first light design where the design was produced before the recording of a text. The experience to be explored is participation in a jury. The text produced was rich with thoughts and emotions. The text also recorded a discernable unit of experience, which can be argued to be discrete from the typical manifestation of design practice. The text exists before the artefact and the text is used as the starting point for the creation of a light design. The undertaking of this case study also provides the opportunity to contemplate the role of judgement in the design process.
The third design is another exploration into the relationship between artefact and text but this time artefact and text are treated simultaneously and not separately. The experiment will be undertaken to complete the triptych of designs, which explore the theoretical implications of theory and practice, artefact and text in relation to Archer’s model. The third design also provides a triangulation of the results in relation to the original design and second light design created for this research.

The line of enquiry will conclude by returning to Design 9. The artefact located at the starting point for this research. The logos of the logo is discussed, as are the results of the three case studies, in relation to what they reveal about the relationship between theory and practice, text and artefact.

The conclusion is not an empirical finding. This thesis demonstrates the creation of a logo, a myth, and an innovative approach to addressing the theory practice relationship through the constructing of a practice led enquiry that experiments with the positioning of text and artefact in the design process. The results of the enquiry reveal that theory and practice in design have a difficult relationship but they are not opposites and that questions have a powerful influence on design. That exploring the logos of the logo of this study can further the design disciplines understanding of the relationship between theory and practice.
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Declaration

I hereby certify that the work embodied in this thesis is the result of original research and has not been submitted for a degree to any other University or Institution.

Michael Dickinson
Chapter 1. Introduction

$DE^Q$ can be thought of as a logo for the research that is the subject of this study. As a logo for the research it incorporates representations of the key elements of the study ‘design’, ‘energy’ and ‘questions’. The elements have been arranged so their relationship to each other has meaning. It is not meant to be directly interpreted as an equation, rather as a thought provoking visual statement “$Design = Energy$ to the power of $Q$ the questions asked”, and there have been plenty of questions but it is not about quantity. It is postulated that it is the quality of the question asked that has an exponential influence on the design outcomes.

$DE^Q$ also makes a silent reference (as apposed to the fondness of text to announce itself) to the theorising of Archer (1979), Dilnot (1999) and Jonas (2000) who argue that the domain of design is ‘artefact’ centric, positioned in one corner of a triangular model of knowledge creation (Archer, 1979). So the logo is a form of visual pun as it (logo as artefact) is made with letters, with reference to the humanities yet has the resemblance of an algebraic formula, which alludes to the sciences and math, but in the context of design, it is a logo, it is a distinct visual artefact. An emblem, in this case of the research, which portrays a visual representation, or to use Alexander’s term ‘gives form’, to the research’s identity. The logo is a pictorial image that epitomises a concept and therefore is embedded with meaning.

The term artefact may need explaining: It is the philosophical term used for discussing man made objects/images particularly in the realm of philosophical debate (Hilpinen, 1993, pp. 156-157; Simon, 1996, p. 5), but it has also become quite common in the design literature that addresses design on a theoretical level (Krippendorff, 1989, p. 11; Buchanan, 2004, p. 36). So within the study there will be reference to the terms ‘design’ and ‘artefact’. Where design is referring to a more discipline specific, professional practice activity and artefact retains a broader meaning, which encompasses the wider ranging manifestations of man made things.

Archer’s model (being triangular) has three corners; Design, which uses ‘artefacts’, occupies a corner while the other two corners are occupied by the Humanities, which use ‘words’ in one corner and the Sciences, which uses ‘numbers’ in the other. Archer is passionate about this third area of knowledge creation and he presents his position which can be seen in the following statement, “…the capacity for constructing in the mind’s eye a comprehensive image of some existing or projected product, system or event, and revolving or modifying that image in the light of various considerations, is a competence that owes little or nothing to education in literacy or numeracy. …for the most part (it is) suppressed, rather than
encouraged, by conventional attitudes to knowledge and education.” (Archer, 1981, p. 34) Archer’s model and the positioning of a number of disciplines is illustrated in the diagram in Figure 1. In the theorising of Dilnot (1999) and Jonas (2000), they focus on Design as a domain that is artefact centric and also argue that design occupies the third corner in a knowledge creation model. They both argue artefacts as a major form of communication and knowledge construction. Yet their theorising and communication of design knowledge is heavily text centric in as much as it is predominantly presented in, and accessed through, written documents. Such a statement could lead to questions like: Where are the great knowledge generating artefacts? What is the relationship between artefacts and numbers? Or aren’t you already an apologist, a turncoat from the side of truth, honour and the artefact way by lowering yourself by engaging in writing?

As interesting and valid as these questions are it is not where this thesis is going and they will have to be left to future studies.

Figure 1 Archer’s model

*Figure 1 is a model of the construction of knowledge as presented by Archer in his 1979 paper ‘Design as Discipline’* (Archer, 1979, p. 20)

Artefacts and their relation to words, to text is the key issue in this study. The research direction was nominally set to undertake the creation of three artefacts, designed to allow the exploration of these relationships by engaging in a research process, which aimed to reveal the 'silent language' of design, discuss the role of judgement in design and explore the
possibility of melding, unifying text and artefact, theory and practice. Through the study of the three artefacts, which make up this triptych of research.

All three artefacts will nominally be lights. That they are lights is not critical in itself to the investigation though having set this as the parameter for the study, the intrinsic nature of the function of lighting becomes part of the study and is highly symbolic of the research intent. To design a light is to create an artefact that will illuminate that which cannot be seen, but these lights are intended to work both physically and metaphysically and therefore also illuminate that which was not known. These thoughts provided a focus and defined the parameters to allow the act of design to take place.

THE PROBLEM
Although a basic outline of the study in becoming visible through what has already been written, at a more fundamental level the problem to be engaged in this research is to undertake a study that is not based on an outside perspective. An outsider looking in nor locating the study at the fringes of design practice but a study located in its artefact domain working from the inside of design practice looking out. I am inspired by Geertz's statement, as I deal with the issue of setting the problem context of the study. “The sequence of settings into which you are projected as you go if not forward at least onward, thoroughly uncertain of what awaits, does far more to shape the pattern of your work, to discipline it and give it form, than do theoretical arguments, methodological pronouncements, canonized texts, or even…. intellectual creeds.” (Geertz, 1995, p. 134) but I do not want to become his disciple nor become some type of anthropologist. As radical as his approach was and as interesting as his writing is, he is writing as and to anthropologists. I want to write as a designer to designers. To conduct research ‘through’ design as argued by Frayling, (1993). To use Glanville’s (2005) position of ‘prepositional intentionality’ in the use of ‘of ’ and ‘for’ when structuring research. Where ‘knowledge_of’ conforms to the scientific investigation of what exists and “Knowledge_for, is the knowledge needed by those whose function is to act rather than describe. These include architects and designers,” (Glanville, 2005, p. 92) While also embracing the thinking of Verbeek, (2005, p. 6) who argues, it is not only we who affect the material; the material affects us.

THESIS QUESTION
A study located in its artefact domain working from the inside of design practice looking out asking. What relationship might exist between text and artefact, such that they support each other?
Why is addressing this problem important? While sitting, listening to a keynote presentation by Kees Dorst (2006) where he was presenting his model of ‘levels of expertise in design education’ (Dorst & Reymen, 2004) at a public lecture at the University of Technology, Sydney, he almost as an aside, commented on the number of designers he knew who had obtained PhD’s who were now unable to go back to design practice.

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<td>Nescient</td>
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<td>Novice (Rule based, 1st year student)</td>
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<tr>
<td>Advanced beginner</td>
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<tr>
<td>Competent</td>
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<tr>
<td>Proficient</td>
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<td>Expert (implicit)</td>
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<td>Master</td>
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Figure 2 Dorst’s model

The model presented in Figure 2 is the model presented by Dorst who acknowledged H.L. Dreyfus’ earlier work in modelling experience in developing his model. Dorst’s model with fuller detailed descriptions of each level is available in Dorst and Reymen (2004, p. 3). The key point Dorst was making at the time of his presentation was that moving up the levels of understanding was not a case of more learning but a case of changes in thinking patterns.

I was shocked and somewhat dismayed by his account of the effect of postgraduate study on design practitioners. A subsequent anecdotal investigation of the validity of the statements confirmed Dort’s observation; I will call it a trend of, design practice abandonment. This provided the impetus and the reason for the “from the inside of design practice looking out” approach to this research and it is important because the benefits of theorising about design practice/ artefact knowledge should nourish and feed back into the design discipline. Be relevant to practitioners and evident in their designs.

But if those design practitioners who undertake postgraduate PhD research lose their ability, and desire to design in the process, then it appears we are clearing the minefield of integrating design into the academic research culture with an unacceptably high collateral damage, with only a vague hope that one day someone can cross the field unscathed.

This is why addressing this problem in the way this study does is important.
Given Dorst’s position on the change of thinking required in his model of learning, it was decided that three things were to be achieved with this research undertaking. Firstly, experience the change of thinking, with reference to Dorst’s model (Figure 2). Secondly, conform to the academic rules and objectives of postgraduate study and thirdly, remain in love with design and the domain of artefacts. Of course self-experimentation has had some disastrous results, Jesse Lazear’s self-administration of the yellow fever virus comes to mind. He proved his theory but died in the process. Something so dramatic is not envisaged but in reference to the experience of others, reported by Dorst, the erasing of one’s desire to design is on the table, so from a personal perspective the stakes are high.

Thus the aim of this research is to engage in the production and use of artefact based knowledge through the design of and reflection on three light designs within the parameters of a period of focused study. Thus providing the opportunity for some of the artefact created knowledge to be expressed in the more widely understood form of knowledge creation, words/text. Numbers would also be an interesting and arguable, equally valid relationship to pursue, but will not be explored in this current research endeavour.

The significance of this research is in the intellectual battle between intuitive and systemized design thinking. The research is unlikely to solve the issue that has implications that extend into fundamental belief and worldview positions for the individuals who practice design and for those who theorise about design. In the end this research is an attempt to bridge the gap to add to the body of enquiry, knowledge that will move the discipline forward, as the artefacts designed by designers address a world of increasing complexity.

Alexander refers to the loss of innocence “…the loss of innocence is intellectual rather than mechanical. But again there are people who are trying to pretend that it has not taken place. Enormous resistance to the idea of systematic processes of design is coming from people who recognise correctly the importance of intuition, but then make a fetish of it which excludes the possibility of asking reasonable questions.” (Alexander, 1970, p. 9) What is interesting here is that despite Alexander’s firm position in terms of the need, use and understanding of systemic approaches to design his position on logic is quite expansive. Rather than adhering to a narrow, prescriptive, deductive position he embraces a wider more general approach, arguing, “That it is the business of logic to invent purely artificial structures of elements and relations.” (Alexander, 1970, p. 8) So it is with the constructing of this research. The structures and relationship are artificially invented and imposed to allow the reader to see what is revealed.
Besides, to put it in the context of ‘things’, the man made artefacts we accumulate around us, at times reluctantly, at others exponentially. ‘Things’ are a huge part of our daily lives. The relationship between how we design them and how we theorise about them is inherently important and significant. As Verbeek puts it “Social scientists study humans, philosophers study words and ideas. Who studies things? There are more (‘things’ - artefacts to study) than ever and they keep coming, evolving, new species of human artefacts are appearing as fast as natural living organisms are disappearing.” (Verbeek, 2005, p. 6)

**LIMITS OF INVESTIGATION**

This study cannot cover all aspects of design. It should also be noted that the author touches on but does not pursue the Science, Notation Numbers corner of Archer’s model. This is in no way an indication that this is not an area worthy of investigation, it is simply the influence of how the research grew and the limitations of time to adequately address another line of enquiry. It would make an excellent area for future study.

**OVERVIEW OF THE STUDY**

To aid in following the logic of the arguments presented in this document, the following sketch of the structure is provided. Having introduced the study, setting out the aim, the problem and why the study is important, the process of achieving the research has been set in motion in Chapter 1. Chapter 2 provides a background to the study in the form of a literature review; it has been divided into two sections. The first half explores the thinking of high profile design theorists while the second half presents selected studies that support the findings of the first half but utilises the education literature domain as its source material. All of which lead to a greater understanding of the background of the study despite the split or cross-disciplinary literature location. Chapter 3 starts with a restating of the question before discussing observer effect, the use of artefacts in research and text based forms of presenting research. These discussions lead to an analysis of research possibilities and the detailing of a research plan and the procedure for conducting the study. The results of conducting the study are presented in Chapter 4. It contains three sections, each section dealing with one of the three objects, which create the triptych of designed objects that are the central focus of this study. The concluding Chapter 5 will discuss the implications of the results and the contribution the findings make to our understanding.
Chapter 2. The background to the study

Preamble

Before presenting the research plan in Chapter 3 and the subsequent results of the study in Chapter 4. A review of literature, which can inform and enhance the understanding of the study was undertaken and is presented here. The review presented in Chapter 2. can be divided into two distinct sections.

The first half has three main headings ‘Heart of Darkness’, ‘The Darkness’, ‘Marlow’s Response’ and ‘Where do we go from here?’ It uses Joseph Conrad’s book ‘Heart of Darkness’ to frame the results of a review of key players in the area of design theory.

The literature referred to in the second half of the chapter sets out to confirm and understand the relationship between theory/practice in design education. It has used literature from the field of education as its primary source. It explores what has been said about the purpose of theory in design, and presents selected research findings that accounts for both studio and non-studio design education perspectives.

The chapter concludes with a section titled “So what was found?” where ‘Gorilla suits’ amongst other things will be discussed. This may seem odd but it achieves the aim of this preliminary investigation in confirming the direction for the study and determining the implications for the design of the research plan.

Heart of darkness

We start with presenting the results of the initial review of the design theory literature: a process, that exposed a set of contradictions, designs ‘heart of darkness’. It started with a review of major design thinkers, people who were widely accepted as producers of seminal texts in the field. Despite some interesting discussions over whose names should appear in such a list, names were chosen and their thinking explored. Some names like Norman, Papanek and Schön were a pleasant revisiting of texts that were introduced in undergraduate studies while others were an exploration of texts that were referred to rather than actually read in previous studies. It was quite an agreeable endeavour at least at the start and it should be noted that the texts referred to here, were not the only texts read but they are those that relate specifically to the heart of darkness experience.
This section could be called ‘A journey through the thinking of Viollet-le-Duc via Alexander and Co arrives at Jonas’ or ‘From Europe to the Congo and back.’ This element of the ‘Heart of Darkness’ to be found in this review relates to the depth of conflict between theory and practice in design, which is revealed.

In the depths of the Congo, in the jungle of real world, professional practice follows laws and principles that are real yet elusively inarticulate. Explorers from the land of theory, with their axiomatic culture, observe, record, and postulate but fail to grasp the shifting, swampy nature of a community of practice built on future contexts, the artificial and the appropriate rather than the true.

In one of those serendipitous moments that just happen, Joseph Conrad’s Heart of Darkness (if you don’t know this story, it is regarded as the major reference for the movie Apocalypse Now) was read in the midst of reading the texts to be reviewed. What was meant to be a diversionary break, ended up becoming the binding agent that linked the texts into a cohesive reading! I would argue the Rosetta that changed what I was seeing, that framed the literature being reviewed because the reading became a journey, a journey into dark contradictions!

Viollet-le-Duc, Alexander, Broadbent, Jones, and Rittel, these names represent classic authors on design but as I explored the written positions of these established proponents of design theory, a problem emerged. A problem, which is anecdotally silently thought by students as they study and again anecdotally believed to be a view held by many practitioners. It is a problem, an anecdot al belief, a darkness, which actually finds confirmation in the respective writing of each of the above theorists. Specifically, what is written about design and what is done in practice are worlds apart.

In the book Heart of Darkness Marlow sets off in a spirit of adventure to the Congo to find Kurtz, a legendary ivory trader. I too set out on my own adventure at the beginning of the reviewing, though it was somewhat more bookish in nature. Conrad’s book follows the classic format of the solitary journey genre: The descent into darkness, a ‘hell’, with a subsequent return to the light. It is this, which sets off an unforeseen dilemma. In O’Prey’s analysis of the meaning behind Conrad’s book he argues that Marlow discovers only darkness at the end of his journey and “…that the price of understanding is the soul-madness of Kurtz” (Conrad, 1989, p. 21)

If the review of the seminal texts followed a similar path, then what Marlow does when he returns from the Congo will be of interest. But this discussion can wait until after the review.
of the texts. One must enter the Congo first if one is to return. To do this, a selection of seminal texts by design theorists are reviewed following a chronological order started with the earliest writer Viollet-le-Duc.

VIOLLET-LE-DUC 1814-1879

Viollet-le-Duc was a professor of architectural history who lived between 1814 and 1879. He produced two major works Dictionnaire Raisonné de L’Architecture, 1854-1868 (a ten volume set of books) & The Habitations of Man in All Ages. The dictionary is a landmark in design literature and is regarded by many as the “…most influential architectural dictionary of the nineteenth century”. (Hearn in Viollet-le-Duc, 1990, p. 3) This monumental work of literature took fifteen years to complete. The Habitations of Man in All Ages, 1875 was a 392-page book, which was first published in English in 1876 and is still referred to particularly in the field of architecture but has a wider influence.

Figure 3 Viollet-le-Duc illustrations

The cat image (a) (Viollet-le-Duc, 1881, p. 6) was used as part of a discussion on the use of perspective while the leaf images (b and c) (Viollet-le-Duc, 1881, pp. 28, 30, 31, 32) were used to illustrate his theories on patterns, proportions and the corruption of these in the lower part of (b)

He is a product of his era and his writing style has similarities in form and language to the writings of Dewey and James. They all used short stories to present and explain their theories.

But I am exploring Viollet-le-Duc’s theoretical writing here and by today’s standards the texts are very preachy in style. In Learning To Draw, Viollet-le-Duc (1881) uses the narrated
discourse between a student and a master. What he establishes is a theme of observation, experience and practice as the major way of becoming expert in design—a message he repeats in many of his stories.

To Viollet-le-Duc the act and practice of drawing was paramount. To quote him: “In the study of drawing there are two elements—physical labor [sic], the exercise of the eye and the hand; and intellectual work…of constructing a habit and establishing an intimate relation between the eye, brain, and hand, so that one of these organs can never receive an impression without the other two being able to second it.” (Viollet-le-Duc, 1881, pp. 66-7) A position that Gedenryd (1998) more than a century later argues in a more modern style but the message is not really different.

Viollet-le-Duc makes multiple references to the use of ‘habit’ (Viollet-le-Duc, 1990, p. 193) and its educative value. This was in line with contemporary thinkers of his era, James possibly making the point more forcefully, stating, “Habit is thus the enormous fly-wheel of society…It keeps the fisherman and the deck hand at sea through the winter…(it engrains) the tricks of thought, the ways of the ‘shop’ ” (James, 1950, p. 121).

**Figure 4 Examples of designs by Viollet-le-Duc**

The images are from Viollet-le-Duc (1872, p. 126, 1863, p. 22). They are shown simply to give you a feel for the sort of man he was. Note: the integration of structural and decorative elements in the first Figure and in the second figure he is increasing the floor plan by proposing cross bracing to classic stone elements in this market place. It is not only impressive but it gave him a great amount of credibility in the practice-based community.
Viollet-le-Duc in line with his contemporaries argued that practice, habitual practice, was a key element of learning any profession. Here was a great thinker on the subject of design, who practised and wrote on a grand scale, long before design evolved into discipline specific specialisations. A contemporary of Dewey, James and Emerson he was articulate and passionate. He presented many ideas that still have currency today. He is presented first because of his position as a forefather of modern design theory. In terms of his text based contribution to design theory he was prolific, respected and passionately committed to the discipline of design. The remaining people to be discussed are all from the twentieth century, starting with Christopher Alexander.

**ALEXANDER 1936 -**

Christopher Alexander is a far more contemporary design theorist than Viollet-le-Duc. Indeed his name appears in the research by Chayutsahakij (2002), which has surveyed the design discipline and listed him as the number two author of the most read books by the members of the design discipline. His text based theorising is extensive when one includes his other books, articles and academic papers but it is the *A Pattern Language* Alexander (1977) that the survey identifies as most read, at 1171 pages in length it was a significant text based presentation of design theory. An architect by training he later taught as a professor at Harvard.

**Figure 5 Examples of Alexander’s lists and drawings**

Alexander was prodigious in his production of lists. Figure 5a (Alexander, 1970, p. 162) presents a component of a larger network of interaction he has documented in Figure 5b (Alexander, 1970, p. 153) in his exploration of an Indian village structure. He detailed every aspect of the village in his search for patterns. The diagrams he developed from these lists have an esoteric feel but were attempts to visualise the patterns he found.
His published works are varied. Alexander organised grand participatory design experiments with notable examples produced in America, *The Oregon Experiment* (Alexander, 1975) and in Germany, *The Linz Café* (Alexander, 1981).

Alexander’s seminal text *A Pattern Language* (1977) is philosophical in nature and tries to express fundamental timeless design principles. The language is more modern, but like Viollet-le-Duc there is a call for observation and the analysis of details, but his particular contribution was articulating the role and use of patterns, the search for patterns and revealing of a pattern language, the recognition of which presented a thinking tool, which would allow the designer to transfer thinking between projects. It should also be noted that one of the reasons his writing is still so popular is the way he actually designed the layout of the *A Pattern Language* as a document. The book acknowledges in the preface that the text, the writing and the layout, had been specifically designed for designers to read. This meant it had quite a peculiar style but it worked. The poetically philosophical writing presented in *A Pattern Language* has remained readable, popular and respected through to today. It gets a number one listing in the best sellers list for ‘Urban Planning and Development’ on Amazon.com (2009). His influence with educators and practitioners cannot be dismissed and has indeed been widely acknowledged.

**BROADBENT 1929 -**

Geoffrey Broadbent also produced influential texts within the design literature but from the other side of the Atlantic. He Lectured at Manchester, York, Sheffield, and Portsmouth Universities UK. He undertook extensive research into design methods and in the process produced the ‘spiral design process model’ an adaptation of earlier work by Mesarović, (1964) and Watts (1966, p. 85). He is a key figure in an academic movement to understand design methods. He, like others in the movement, focused his efforts in applying academic rigour to the study of design as a discipline and to the application of scientific standards to the researching of design.

Many of today’s practitioners, especially those educated in the 70s onwards would have been presented a diagram, (see Figure 6) or one of its variations as part of their education. It was part of a rationalisation, a logical approach to the exploration of how design was practised, with the promise of not only providing an understanding of practice but of improving performance. His writing is reassuringly rational with logical steps, which make the design experience appear logical and rational and easy to follow, the assumption being that there was a method that once recorded and understood would be easy to duplicate. His clearly articulated analysis of the creative experience of designing appear logical, systematic and to be within the grasp of all.
Figure 6 Broadbent spiral design model

Broadbent (1988, p. 258) The diagram is reproduced from a 1988 publication but this model was originally published in a 1973 version of the 1988 book. The model itself is an adaptation from the earlier work of Mesarović (1964) and Watts (1966). It represents an evolving process of analysis, evaluation and synthesis, which progresses towards the final design outcome.

Broadbent has been discussed before Jones despite Broadbent’s major writing coming after Jones’ writing. This has been done because Broadbent fits neatly in with the other people already discussed as a respected author of design theorising. Jones despite also being a theoriser in his own right has a more unique claim to fame as a chronicler.

JONES 1927-

Even those in the design field who have little time for theorising design tend to have encountered his book *Design Methods: Seeds of Human Futures* (Jones, 1970) because of its breadth and a layout that was tailored to a design audience.

He studied engineering at Cambridge University but specialised in ergonomics and user-centred issues. He also consistently asked designers to question the purpose of their design activity, asking them to give substance to new ideas through the systematic analysis of the problems at hand, using a combination of rationality and intuition.

The book is widely regarded as a seminal text, because it reviews thirty-five design methods, that have been collected, sorted and are clearly set out to engage a design practitioner readership. In simple terms he categorises the theoretical approaches he uncovers into three types: Designer as Magician, Designer as Computer or Designer as Self-Organizing [sic].
Figure 7 The three-head spaces of designers according to Jones

The images are from three separate pages within Jones’ (1970) book. They are graphical representations of the three positions that Jones argues design theorists have taken in relation to the practice of design. The first image, ‘Designer as Magician’ representing theorists who “…imply that the most valuable part of the design process is that which goes on inside the designers head and partly out of reach of his conscious control.”(p. 46) The second image ‘Designer as Computer’ referring to “The inventors of the most systematic design methods (who in his book) seem to imply that a human designer has full knowledge of what he is doing and why he is doing it (p. 50). The third image ‘Designer as Self-Organizing [sic] system, a situation where a “partial search to find short cuts across unknown territory” is conducted and informs the strategy used, the design team and the problem definition. The controlling, informing and evaluating of an influx situation, the design process, that leads to design outcomes. (p. 55)

He covers a wide range of design methods current at the time of his research from well-accepted theories similar to Broadbent’s to what could be called ‘exotic’. He acknowledges that design theory “…is the attempt to isolate the essence of designing and to write it down as a standard method, or recipe, that can be relied upon in all situations.” (Jones, 1970, p. 3) There are conflicting and contradictory proposals presented but Jones works his way through the methods he has selected, explaining where they differ and why. As examples of ‘Designer as Magician’ design methods Jones uses ‘Brainstorming’ (Osborn, 1963, p. 158) and ‘Synectics’ (Gordon, 1961). Both these processes were originally designed to stimulate a large set of ideas. The systems were used extensively and Brainstorming as a term has entered the language with a wider meaning than the original ‘idea finding’ process Osborn had recommended. Indeed Osborn did not offer ‘Brainstorming’ as a panacea or a magical solution to solving design problems stating that, “We must fully recognize that idea-finding is only a part of the problem-solving process.” Arguing that the use of judgment was also critical “…imagination-without-judgment is more deplorable than judgment-without-imagination.” (Osborn, 1963, p. 136) Despite the categorisation as examples of ‘Designers as Magicians’ Osborn makes only a passing reference to the “magic” of being able to dream (1963, p. 29) while Gordon makes no reference to magic at all.
In questioning if a design problem “… can be split up, or decomposed, into separate pieces that can be solved in series or in parallel.” (Jones, 1970, p. 50) He uses the ‘Designer as Computer’ as being indicative of the direction some theorists are heading in their desire to fully expose the process to explanation and repeatability. An example of one of the methods he has put in this category is ‘Boundary Searching’ (Harper, 1965) an adaptive strategy, which aims to provide the limits of opportunity for design action or intervention in a scientific approach to the design process.

![Boundary Searching](image)

**Figure 8 Boundary Searching**

Jones (1970, p. 135) the example Jones uses is the design of a moulded polypropylene chair where because of its flexibility the loading characteristics are difficult to predict certainly by calculation. The purpose of following this method is to determine where the acceptable solution will lie.

An example of the more exotic would be Matchett’s ‘Fundamental Design Method’ (FDM) that came with its own mental health warning.

What does Jones have to say about Matchett theorising? He does not dismiss it. Jones specifically states that the “results of FDM seem to be good” (Jones, 1970, p. 189) which is decidedly more positive than what he does say for a lot of the other models he presents. So despite being relatively positive about Matchett’s model he gives the reader the following warning “There are probably risks to mental health in trying to copy the intensive introspective aspects of FDM training” (Jones, 1970, p. 190). He expands on his health warning, stating that “Anyone wishing to tryout FDM without the help of the inventor should realise that he is exploring the part of experience that is accessible through religion, through art, through psycho-analysis, through group dynamics, through drug taking, through insanity, through self-mastery courses and through indoctrination: it is an aspect of experience that some people believe to be wickedness or self-delusion and others believe to be the ultimate reality and the ultimate good.” (Jones, 1970, p. 189)
In Matchett’s method the objective is “To enable a designer to perceive and to control the pattern of his thoughts and to relate this pattern more closely to all aspects of a design situation.” (Jones, 1970, p. 178) but Jones argues that the process is difficult to explain without direct experience and possibly training by Matchett himself.

So why does Jones include it as a design model? Matchett, the inventor, has an excellent track record of commercial design projects. Far more than some of the sane looking academic models which have no actual design projects to substantiate that they actually work.

Jones is highly regarded because of his comprehensive collecting and presenting of models of design thinking. Even the more exotic examples like Matchett. But before the reader gets too side tracked contemplating Matchett’s model which is not the main thrust of this review we will move to the last author to be discussed in this section, W.J. Rittel.

RITTEL 1930 - 1990

“Rittel served as a sort of funnel transferring knowledge (developed during and just after World War II) from the sciences and engineering to the design professions.” (Chanpory & Dubberly, 2007, p. 72) With a thirty-year career in influential positions in Ulm and Berkeley he presented and propagated a rationalist approach to design with the teaching of a design methods or a systems approach to design. He is now more famous for his coining of the
term “wicked problems” which in part grew out of his effort to search for a scientific basis for addressing the complexity of design problems. Problems which in contrast to classic scientific problems are difficult to define and lack objective or meaningful correct /false solutions. Rittel produced a second-generation design methods position, which was an attempt to address issues with the original design theories he had developed.

His concept of ‘Wicked Problems’ is still very useful in explaining and understanding the limits of problem setting in design.

But he, like the other designers discussed, sets out in text, theoretical discussion, principles, models and methods to use when designing. Collectively these eminent bastions of design theory have been presented and read by members of the design discipline. The natural assumption is that theory is good, good for design and good for design practice.
**The Darkness**

The following section sets out a series of specific quotes-statements that each of the previously discussed theorists have made. They are presented in the same chronological order as the previous section.

**VIOLLET-LE-DUC**

So what did he have to say despite being one of the most prodigious producers of design texts in papers and books?

“Volumes have been written on the beautiful (Aristotle) in art, but all the paper that has been printed never caused a fine work to be made.” (Viollet-le-Duc, 1881, p. 226)

“…young architects have asked me what treatise on building I should recommend as best. There is none, I tell them; because a treatise cannot anticipate all contingencies…ninety-nine times out of a hundred you have to encounter the exception and cannot rely upon the rule. A treatise … does not actually solve them, or at least only solves one in a thousand. It is then for intelligence to supply in the thousand cases presented what the rule cannot provide for.” (Viollet-le-Duc, 1876, p. 61)

Asked about the best method of obtaining an education he replied, “Why, -as I have shown you, -by practising it. In France, at any rate, no other method has been employed hitherto, and perhaps this is the best.” (Viollet-le-Duc, 1876, p. 84) These quotes come from *How to build a house, an architectural novelette* in which he really discusses how to build or treat a student. It is set as a discourse between a master and apprentice. His objective is to impart the need for rationality in thinking to the reader but it also provides an opportunity for what appears to be an autobiographical account of poor institutional education saved by on the job practice based re-education. His position, forget formal education, get a job, learn by practice. Despite being a prolific author, he argues no treatise holds design solutions; no amount of words will ‘cause’ design.

OK, not what you might expect him to say. There are some that might protest, “We can ignore him, he was from too far back in history”. Maybe we can gloss over a little contradiction. Let’s look at Alexander.

**ALEXANDER**

Asked in 1971 what problems, design methodology had successfully attacked, he responded with “The fact is that it has solved very few problems for me in my design work” (Alexander, 1971, p. 4). Pressed further he states “I would say forget it, forget the whole
thing. Period. Until those people who talk about design methods are actually engaged in the problem of creating buildings and actually trying to create buildings, I wouldn't give a penny for their efforts." (Alexander, 1971, p. 5) Remember this is from the author of a seminal text within the design community and ranked in the top three books to have been read in a study conducted in 2002 for the design community by the Visible Language Journal (Chayutsahakij, 2002).

Broadbent actually quotes Alexander as saying in relation to design methods, that it can actually, “destroy the frame of mind the designer needs to be in if he is to design...” (Broadbent, 1979, p. 42), which has far too many shades of a Kurtz scenario than I care to contemplate

**BROADBENT**

In 1979 Broadbent produces a review of design methods. In opening he points out that numerous theories have been put forward with the intention that, “…hopefully, designers would be tempted to adopt [the theories] in practice.” (Broadbent, 1979, p. 41) But he concluded by stating as an emphatic challenge "... asked to catalogue its [design methods] achievements, in terms of buildings built, cities designed, and so on, most of its advocates find themselves in difficulties. " (Broadbent, 1979, p. 41)

Even when Broadbent discusses second order design methods, which grew out of the earlier attempts to apply theory to design practice, he still makes the statement ‘ …theory is one thing and application quite another.” He actually makes the argument that the best use of second order design methods, citing specific examples in design, is when you want to delay or even stop a design project. (Broadbent, 1979, p. 43)

He goes further, taking a much broader sweep of the theoretical positioning of the design methods available for designers to use, stating, “So, both extremes of this particular spectrum First Generation or Second Generation – Behaviourist or Marxist/Existentialist clearly are deceiving themselves. It is quite impossible for either of them to avoid feeding their own preconceptions and values into the solution of design problems.” " (Broadbent, 1979, p. 44) What he does finally suggest is the adoption of a Popperian approach where ‘design conjectures’ are used as a method of moving forward.

**JONES**

Now let’s consider the classic Design Methods by Jones (1970). He can’t even finish the book without expressing some fairly negative thoughts. Stating about the design methods he had collected "There is not much evidence that they have been used with success, even by their inventors..." (Jones, 1970, p. 27) His problem is not that he can’t find models or theorising
about how design works, how to improve, teach and explain design. Jones settles on thirty-six examples to record and present in his book. The problem he has issue with is his inability to find evidence of their application in practice.

**RITTEL**

Finally we have Rittel the last of the text producing design theorists presented earlier. What does he have to say later in his career? Asked to give his opinion on the question “What kinds of problems has design methodology successfully attacked?” He answers, “I wouldn’t know of any building that has been done discernibly better than buildings done in the conventional way. … in fact it makes it more involved and time consuming - and you can get away without applying it in most design fields.” (Rittel, 1972, p. 6) He also makes the general comment that many design methods act more like optimisation processes, claiming they are used on “…a task that had already been solved before the procedures to be applied were set in motion” (Rittel, 1972, p. 7).

Rittel does make some interesting observations about disciplines that spend too much time focusing on methodology. “The occurrence of interest in methodology in a certain field is usually a sign of a crisis within that field.” (Rittel, 1972, p. 5) He cites examples in maths and the social sciences. So interestingly within the field of design he argues “The main purpose of design methodology seems to be to clarify the nature of the design activity and the structure of its problems” (Rittel, 1972, p. 5) and therefore the idea that they don’t work in practice is not an issue. Their purpose is to address the crisis in design identity. Which he argues is a product of the changing nature and complexity of design practice.

He goes further to argue, “…that the design process is not considered to be a sequence of activities that are pretty well defined…that you cannot gather information meaningfully unless you understand the problem…[it] depends on the state of the understanding of the problem.” (Rittel, 1972, p. 7) which is a position I can agree with. It also supports the proposition that design is exponentially affected by the quality of the questions asked. Whether the questions asked are of a factual, deontic, aesthetic or process nature.

**ADDENDUM**

To the quotes already provided I would like to add the following two statements. One by Donald Norman the author of the highly acclaimed text *The Design of Everyday Things* (2002) who was ranked number one in the Chayutsahakij (2002, p. 202) survey of the texts most read by designers. He states in an email to the ‘Design PhD research discussion list’ “I stand

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3 **Deontic**: Relating to duty, obligation and or permissibility.
by my claim: I have never seen a verifiable example of a brand new concept (not just an improvement -- brand new) that resulted from design research.” (Norman, 2009) A statement, which only re-enforces Archer’s lament, from nearly twenty years earlier, that despite working within an academic institution, (Royal College of Art, London) in a research unit with the specific objective of studying design methods in action and in the process completing eleven major commercially successful projects. Despite having the intention and opportunity, Archer draws the following reluctant conclusion, “I must admit we were much more successful at doing it than explaining it.” (Archer 1981, p. 31)

Where do we go from here?

Though it may be standard to find out at some higher point in one’s education that things aren’t exactly as you had been taught earlier. The contradictions presented by such key players in design theory are not just variations but refutations of their earlier positions. They raise questions, which go to the heart of theories function within the design discipline-questions that have been asked by Meyer-Veden in the book Mind the Gap. Meyer-Veden argues that the following statements are taken to be true, unquestioningly.

“Design theory improves design”.
“Design theory explains design”.
(Jonas & Meyer-Veden, 2004, p. 32)

But do they? Meyer-Veden argues that the idea that design theory improves design is an assumption. That it is a “very widespread” dogma, which suffers from of a lack of evidence of theory being used by practitioners? Jonas adds to this by saying “…normative process models of designing equally miss the point, as soon as they claim to provide reliable means for improving the quality of designing.” (Jonas & Meyer-Veden, 2004, p. 19) Jonas goes further stating that design is “…a theoretical “discipline”, which even decades after its
“invention” is still lacking a binding canon of criteria which could come close to those of the (natural) sciences.” (Jonas & Meyer-Veden, 2004, p. 32)

Fortunately Jonas is not all doom and gloom but he is not glossing over or running away from the issue either. He argues that apparent formal structures do not enrich our understanding of design process. They highlight trivial aspects and deprive a full understanding. He uses the example of understanding language. Specifically, that if we examine what we read using formal rules, we can misunderstand, or even miss the point of the text completely. The assumption that all designers work in the same way is a recurring theme in many rule-based approaches to understanding design.

Using the language analogy in relation to design, Jonas argues, “If we were to analyze [sic] a sentence in our mother tongue in terms of grammar or logic, we would end up knowing less than we did when we first pronounced or heard that sentence. Understanding this is vital for any further analysis. It is really the shibboleth⁴ of all theory…” (Jonas & Meyer-Veden, 2004, p. 41)

So it would appear there is something about design that has to be seen in context and in situation and as a whole. This type of thinking aligns with Nelson, another 21st century design theorist, who uses a jigsaw analogy to describe why this problem is so difficult. He argues, “Defining the corners and straight edges is easy. Blocks of colour have their own problems but they can be cordoned off, to be dealt with separately. The pieces that are full of obscure patterns and mixed fragments of colour create the central hole, which is difficult to deal with.” (Nelson & Stolterman, 2003, p. 300) Design is full of specifics for which it is difficult to create generalised rules. What Nelson does say about design is “To design is to interject something risky into the world- to create the not-yet-existing is chancy.” (ibid, p. 285) This is a reminder that design is about future contexts. To study that which already exists by definition provides a target to study but to study ‘the not yet existing’ does have its problems. To put in the terms of Marlow’s journey into the Heart of Darkness we undertake a difficult journey. This is the point I had reached before starting Viollet-le-Duc’s review. I promised to return to discuss what Marlow did when he returns from the Congo. After experiencing the true darkness at the heart of his expedition.

⁴ Shibboleth: In the bible, it was the test word used by the Gileadites to distinguish the escaping Ephraimites, who could not pronounce the initial ‘sh’, Judges XII. 6. It now refers to a test or test word.
MARLOW’S RESPONSE

Marlow is the main character in ‘Heart of Darkness’ who travels to the darkness but manages to return and has to deal with the issues of what he now knows and the people who have not seen the dark contradiction. In the *Heart of Darkness*, (Conrad, 1973) Marlow returns to Europe to deliver a bundle (of notes, letters, text based items) to Kurtz’s wife/lover. She then proceeds to press Marlow for Kurtz’s (the darkness Marlow found in the Congo) last words.

Marlow responds by saying “the last word he pronounced was - your name” (p. 110)

This was a lie! The last words to come out of Kurtz’s mouth were “The horror! The horror!” (p. 100)

Marlow argues with himself “… I could not tell her. It would have been too dark – too dark altogether…” (Conrad, 1973, p. 111)

It may have been good for Kurt’s wife to be saved from the truth. But for the design discipline it is a different story, if it faces “The horror! The horror!” (Conrad, 1973, p. 100) After a journey where the design disciplines own ‘darkness’ is confronted. It needs to construct a statement, which is not an easy white lie. It could start with an admission like “…efforts to grasp design foundations (and thus a solid design theory) miss the point - and have to miss the point - because there is no point available to be hit.” which has already been said by Jonas (Jonas & Meyer-Veden, 2004, p. 19). Alternatively a statement with a more positive slant, “…design is rooted in several fields and exists on a transient boundary or interface among them. Many forms of useful design knowledge simply cannot be anchored in a firm basis or foundation.” could be used (Friedman, 2011). After all Viollet-le-Duc’s number one piece of advice to his students and readers who wanted to learn how to design was to travel (Viollet-le-Duc, 1990, p. xvi, 122). He undertook and recommended travel, he was talking literally in the physical sense but this journey into the literature is less physical and more cerebral yet still educational. Ok! No specific answers were found but that is not a problem. Considered in the light of the quote attributed to Friedman in *Mind the Gap* it can be turned into a positive attribute.
“Questions rather than answers are the foundation of knowledge. The difference in value
to the two is a platform for the distinction between information and knowledge”
(Friedman in Jonas & Meyer-Veden, 2004, p. 63).

This final statement brings us back in line with this study’s logo.

Design = Energy to the power of the Question asked

**Theory and Practice in Design education**

As a formal education practice at tertiary level, the study of the design discipline is a
relatively recent phenomenon. That said, the training of aesthetic specialists has a long
tradition. Dissanayake, (1988, 1992) takes an evolutionary/biobehavioral perspective on the
origin of aesthetics in human behaviour tracing it back to our pre-writing past. Though she
addresses aesthetics in a broader context than the modern conception of design. Even within
modern conceptions of design there is breadth in what could be termed design theory. A
broad view has its advantages and this is why Dissanayake’s position is popular with design
practitioners. She supports a complex mystical transference of aesthetic values as an
important component of a healthy society.

But this section is intended to be specific not broad. What does the literature reveal in a
focused review of the delivery of design theory, of design theories interactions with Tertiary
level design education? Let us start with Matysek Jr. who has conducted one of the few
bibliometric investigations, related to the design discipline. His specific focus was
architecture. In his study he found in “A comparison of the pattern of citation in
architecture journals with citation patterns in other disciplines shows that architectural
research does not follow any one of the established patterns of science, social-science, or
who has a significant reputation in the design community, argues that the literature that is
available and useful on the education of designers in higher education institutions is relatively
small and that it is distributed widely across disciplines. Verma acknowledges this situation
arguing, “This may be partially due to the interdisciplinary and therefore dispersed nature of
design theory education, or it may be the sheer breadth of the field.” (Verma, 1997, p. 89)

Designers revel in the artefact. End results are not only celebrated, they are glorified as a
fundamental underpinning of the disciplines knowledge base. Understanding this can be a
fundamental hurdle in any discussion of design and it could be argued one of the key
identifiers of the discipline. The discipline has an almost obsessive focus on interactions with
artefacts as artefacts rather than converting them into words or numbers. Part of this is explained in Papanek’s (1995, p. 7) musing “There is a sense of wonder, a feeling of completion in design that is lacking in many other fields. Designers have the chance to make something new, or remake something so it is better. Design gives the deep satisfaction that comes only from carrying an idea all the way through to completion and actual performance.” From this perspective is it any wonder that the theorising of design can appear a poor cousin to the practice of design?

Much of the design presently practised has been learnt following a master / apprentice tradition. There has been much debate about the traditional master / apprentice, expert/novice approach to education in design typically found in studio subjects. Swann (1996) argues that for design education to remain focused on this as the major form of educational practice will result in the marginalisation of design study at University level. Margolin (1989) argues that the academic study of design should be accepted as a new discipline, calling it ‘design studies’. A position accepted by Newman (1996) an academic with strong links to industry and professional practice. But he goes further arguing that the technical paradigm is and should remain the dominant direction of the design discipline. Within Newman’s argument he postulates that the dominance of the technical and studio orientation of design education bears a direct relationship to the staff employed. Newman (1996) points out that much of the curriculum used in tertiary level design education is ad hoc. The specific staff that make up a faculty and their personal interests provide the driving force in the development of a design studio based course structure. The point being that design practitioners are entrenched in an artefact oriented culture, which is passed from master practitioner to student. With the major component of theoretical understanding left unstated and embedded in the artefacts produced. Krippendorff (1995) argues that this situation is compounded by a culture of professional secrecy. Where, certainly within industry, it is not in the interest of master designers to reveal their thinking to competitors.

A common thread that pervades design education is the concept of creativity. It is highly valued particularly within the professional design culture. Despite repeated reference to it and a general acceptance of its importance both within the discipline and in the public conception of design professionals, Smith & Whitefield, (2005b, p. 6), states a clear understanding of it is seldom articulated. It is often interchanged with the concept of originality and as Koestler (1964) argues, originality’s achievability depends on how demanding your definition is and that the truly original is seldom achieved. What can be stated is the design activity of a designer produces new artefacts. Whether they are creative or original is another debate. The justification for design theory subjects within educational programs is often found in the idea of providing a resource, often a collection of images of
previous design projects and thinking which can be used to enhance future design practice. Because of the practice oriented goals of creativity and originality the relationship between past thinking and previous design artefacts is often overlooked. Viewed as inhibiting rather than providing a solid understanding of the relationship the past has to future solutions. The study of design and the articulation of design are often seen as divorced from practice. Many of the theoretical studies of design often focus on those aspects of design that suit the existing methodologies of other disciplines. Because they follow established research principles they make ‘good research’ and are relevant but as Jonas stated “miss the point” and are generally received as peripheral to the actions of design practice and artefact production by design practitioners.

THE PURPOSE OF A THEORETICAL UNDERSTANDING OF DESIGN

Or why bother when there is such resistance? Verma provides the following definition of the purpose for having theoretical understanding of design. “…theory can be broadly understood by its goal of teaching students to think like designers. To make them self–critical by facilitating their understanding of design issues at a deeper cognitive level, and to help them to see systemic relationships between different facets of design.” (Verma 1997, p. 90) which is very articulate and noble. Design practitioners are more likely to agree with Griffin’s position (1970, pp. 10-11) who argues the purpose of theory is to be able to defend your designs “There is an important threshold to overcome where students become comfortable with the idea of having their own work, ideas distributed and critiqued” To have the artefacts of their design efforts accepted and withstand criticism.

Where does the artefact focus of design come from? Design students despite being labelled as open and creative can exhibit all the classic symptoms of ‘functional fixity’ (Dunker, 1945) (also known as ‘cognitive rigidity, Anderson, 1983). They hold or develop a narrow conception of what design is, they isolate the design theory subjects into a box and shut the lid. This naturally impedes the creative integration of theory subject content into the practice of design. This situation is reinforced by the studio culture of many institutions, which has belittled theory in preference to practice. Therefore the conceptual thinking which is highly valued and encouraged in design practice is not successfully transferred into forms of communication outside the design artefact, but become embedded in the objects, or lost.

This is despite studies like Griffin (1995) and Mayer (1987) which have found that instruction that focuses on conceptual understanding, produces students who achieve better results than those who are taught through more traditional rote methods, in the subjects of maths and reading respectively. Neither studio nor theory subjects are typically taught in a
rote method but the conceptual thinking developed in the theory subjects must link to the studio subjects in a way that allows students to achieve better results in their studio practice and be aware of the benefits. There needs to be examples of artefact focused design practices, which embrace the other corners of Archer’s model of knowledge creation. That articulates and enhances the accessibility of the theoretical understanding of design practice.

Therefore an identifiable need exists for design practice led research which bridges the existing gap between design theory and practice. If designers who treasure an artefact / practice based focus to their professional understanding of self, discipline and domain do not engage in other modes of theorising, then the cycle of the silent language of design will remain prevalent and dominant.

**STUDIES IN RELATION TO DESIGN STUDIO**

The previous section provided a general overview of issues in the relationship between design practice and theory. It provides context for the selected research finding presented now, which reports on specific investigations. The focus of this next section is research that has conducted specific investigations into the theory / practice relationship within tertiary institutions. It will note the research method, areas of disagreement and gaps in the literature. The section’s purpose is to build an argument that the problem tackled by the present study has not been addressed previously and answers a complex unanswered issue. It will conclude with a summary that informs the selection of the present studies research method.

**CLIFF: HOW DO ACADEMICS COME TO KNOW DISCIPLINE SPECIFIC DESIGN KNOWLEDGE?**

Cliff & Woodward (2004) present a small but interesting study, which confirms the practice/ theory split is a product of existing educational practice. He investigates ‘ways of knowing’ discipline specific knowledge, within the design discipline, using lecturing staff from different design disciplines located in the one institution within the South African polytechnic system as his data source. The method used is a semi-structured interview technique and analysed the ‘case-study interview data’ for ‘epistemologies of knowledge’. It had the feel of a phenomenographic study but did not create specific hierarchies nor did it create the ‘outcome space’ typical of phenomenographic research. He only interviewed 9 participants but identifies one point and two specific problems of relevance to the present study. The study pointed out that there were important patterns of educational practice and understanding of design knowledge applied across the respective specific disciplines studied.
The first problem identified in the study was that there was a tension, between staff, which has problematic educational implications. Notably between the ‘studio’ lecturer and the deliverer of theory or non-studio subjects. This was evident in an almost contest like battle for the hearts and minds of students especially in the early period of their tertiary education when they arrive with and search for definitive, concrete answers to what design is. In Cliff & Woodward’s analysis “…students who may carry absolutist epistemologies of knowledge” (2004, p. 288) provide lecturers with an opportunity to lock these students into essentially ‘surface’ attitudes to learning in studio courses.

The second problem outlined in the study was “…how these different views about knowledge are presented to students and what they (the students) understand by perceived conflicts amongst their lecturers.” (Cliff & Woodward, 2004, p. 289) The paper indicated a greater degree of conflict than was directly reported but the questions raised about conflict between lecturers in this area, of the attitudes to the theorising of design practice, has implications beyond the individuals involved which distort the discipline’s ability to grow its own knowledge domain. The next study is more technical but identifies the need for expression of the ‘intrinsic meaning’ in the way designers understand their own design practice. I would further argue that a practice led approach to theory production provides a path that could mend rather than exacerbate the present situation. But before this proposition is explored another study, which investigates the theory/practice divide, will be analysed.

DAVIES AND REID: PROBLEMATICS IN DESIGN EDUCATION AND THE DESIGN ENTITY.

This study despite having a strong design identity focus provided valuable insights into the design studio/design theory debate. Davies and Reid (2001) followed a phenomenographic approach. Recording the experiences of studio students and staff from institutions in both London and Australia. The number of participants in the study is not stated, but the document is a development of earlier and current research at the time of publication. This analysis also includes reference to earlier papers by Davies (2000) and Davies (1996).

The areas of focus within the study are the use of projects as the basis of learning, critiques for assessment and the studio approach to teaching. Of particular relevance to the present study are their findings in regard to the studio approach.

The paper argues that as a fundamental principle, learning approach is governed by an individual’s concept of learning. (Davies and Reid, 2001)(Marton & Säljö, 1976b). Davies and Reid accept the concept of ‘deep’ and ‘surface’ learning without challenging the principle but
make the point that “…little comparative research has been undertaken in practice-based subjects to ascertain whether these constructs are equally valid” for studio-based education. Having acknowledged this problem they report that early indications are of a similar break-up of perception, as reported in Biggs (1999), can be found in studio-based education. To make this assertion they rely heavily on Reid’s earlier research to make the case. It can also be seen that text based learning is the standard to which studio based learning is compared.

From their design specific research they state (Davies and Reid, 2001, p. 3) “…we noticed that there was a direct relation, in many cases, between students’ conception of the design entity and their conceptions of, and approaches to, learning.” In relation to the present study what Davies & Reid call the ‘design entity’ is a mental construct. This construct could be described as a belief system about what design is and for students who are starting design study their construct is likely to conform to a general public understanding of the design discipline as discussed in Smith & Whitefield (2005a). The construct is changed through a process of enculturation and the transference of constructs held by the practitioners they encountered. They note that this is particularly evident in the patterns of learning established in formative initial contacts. If their enculturation is predominantly studio based with a focus at the extrinsic technical level of design practice then the influence on students’ learning patterns and therefore their changing conception of the ‘design entity’ will be characterised by ‘surface’ learning as opposed to ‘deep’ learning as discussed in Marton & Säljö (1976). This early influence is carried through to their professional lives and the relationships they have to their own designs. The point being that the student’s approach to the act of designing and to being a design practitioner can be potentially locked into a technical, doing conception of design rather than the deeper, broader thinking conceptualisation of design discussed by Swann (1996) and Margolin (1989). Unless we are challenged by examples that can bridge the text/artifact, theory/practice, gap in an appropriately accessible form, this pattern of behaviour will continue.

Researchers will continue to collect statements like:

“History is very important and there is a lot of theory at the moment in my course, but what I hunger for the most right now is to really get into the craft side of things’ (Student 7)

Davies & Reid (2001, p. 3)

There are other studies, which dealt with design studio in the development of designers but as interesting as many of them were, the two selected presented the most specific confirmation of the existence of a theory/practice divide. The studio area has attracted more research than the non-studio, theory areas within tertiary design education.
It can be concluded from these studies that the theory practice divide is not simply anecdotal, nor is it simply a product of theory’s inability to present as relative to design practice. It is also actively disengaged from practice by the very artefact focus from which designers create their professional identity. The next section moves on to review studies, which have focused on non-studio, theory aspects of design education.

**Studies of Non-studio, Theory aspects of Design Education**

Unlike the previous section where selection processes of which studies in the literature were most relevant to the present study were undertaken, the more appropriate question in this ‘non-studio’ section is “Have the non-studio, design theory aspects of design education been studied?” From the data bases consulted in this review it was found that there are studies of educational practice, which focus on the studio as a distinctive and positive location for design education (Portillo & Dohr 1989)(Uluoglu 2000)(Chen & You 2010) but non-studio design theory educative processes have been largely untouched both nationally and internationally (Verma 1997). There is however a non-phenomenographic, mixed methodology research report of particular interest. Set in the Australian context the study titled ‘Opening Pandora’s Paintbox’ was written by Connellan (2002) and conducted for the South Australian School of Art. Its primary aim was to produce a benchmark of current history and theory educational practice in design education. It appears to have been created, as an internal document but the 169 pages of the report is available on Connellan’s web site. The 211-page appendix was made available upon request.

The study sets out to be a national survey and its approach and criteria are clear but varied. It uses a mixture of methodologies both in the collection of data and in the analysis used to produce the findings.

In a search that used the terms ‘design history’ and ‘design theory’ as a filter, twenty-seven of Australia’s thirty-eight universities were identified for participation in the Connellan study. Of these, eleven participated to varying degrees. Most (if not all, it was not made clear) of the in-depth interviews, focus groups and course evaluation data came from the University of South Australia. The other universities provided what was called a “dialogue”. This took the form of email transcripts, which provided a snapshot of current practice and opinion in what might be called an appraisal of the status quo at least between those institutions, which contributed 41% of a complete national survey.

The lecturer dialogue was initiated by asking the following questions (Connellan, 2003, p. 3)

1. Are design students taught art history or do they have history and theory courses that are more design oriented?
2. Could you provide a list of lecture topics, assignments and courses that may have been tailored to meet the needs of design (as opposed to art) students?

3. Which of the courses have been the most successful and why?

Of immediate note is that the very structure of these questions implies history and theory subjects as being seen as separate from the studio, practice oriented subjects and that there is a search for examples of integration, or specific tailoring to design.

It can also be identified from the questions that a major focus of the study was to identify the delivery, curriculum and attitudes specifically aimed at design students. This is because, as was also noted in the research report, many of the design schools were located within art schools. The report used the term ‘art canon’ or simply ‘canon’ when referring to the more widely accepted relatively uniform, established methods of delivering art history and art theory within fine art education at a tertiary level. This idea of an ‘art canon’ was used to juxtapose the results of the design specific enquiry.

For instance the study found in the participating universities (Connellan, 2003, p. 3) “… at least one course and generally as many as three courses that have evidence of the canon” were embedded within the design education delivery. Though some participants saw this as natural or positive, the larger percentage wanted to see course structures that were not still using art history as a model. Many participants cited work load pressures for not revising course structures but the situation was complicated by a predominance of art history trained lecturers being used to present theory input into the designers training (Connellan, 2003, p.4). There were however examples of lecturers who not only saw a need for change but had also instigated revised course structures.

Despite his own classic art history training Dr McNeil (theory lecturer UNSW, Sydney) stated, “…design students should not be taught the type of design history or art history that one might teach future art or design historian… Studio is their priority; otherwise they would be in a art history program, and lecturers who do not recognise this risk alienating the students…very few art historians teach like this anyway, although too many pay lip service to design…” (Connellan, 2002, p. 26)

As part of the research used in Connellan’s study, a seminar was conducted in March 2002 at the Adelaide campus of the University of Adelaide. Many of the issues raised in the course of the research were aired. A “heated but certainly lively debate” resulted (Connellan 2002, p. 163). The following is drawn from notes, provided in Connellan’s document, that resulted from the panel’s discussions.
CONFLICT FROM ALL QUARTERS.

“It was eminently clear that the views of lecturers in history and theory of design and those exclusively involved in industry and the studio practice of design, have different and even opposing views at times.” (Connellan, 2002, p. 163) Despite this Connellan argues that there was often even greater tension existing within academia. Questions at the very heart of what a design education is, between a text centric and an artefact centric world view, between the pedagogical positions of studio and the non-studio lecturers, clearly illustrates a long-standing demarcation that can be explained as competing representative examples of the two corners (artefacts and words) in Archer’s (1979) model. This is evident in Whitehouse’s (theory lecturer RMIT, Melbourne) response to one of the panel discussion questions, about the relevance with a capital R of design theory. The depth of the real divide that has existed for a long time between studio and non-studio subjects in design education was exposed. “…design education’s [sic] has a bias against history and theory which has its origins in Bauhaus pedagogy with its ideal of a design intelligence ‘discovered’ intuitively by gifted individuals through the creative process, through the exploration of material and form….a visual language that speaks directly to the mechanics of the eye and brain (the senses and intuition) rather than to the culturally informed intellect, fostered the development of design principles and processes in isolation from their verbal articulation.” (Connellan 2002, p. 144)

With this sort of historical background, the study almost inevitably found “communication and understanding is lacking between studio and theory staff in some universities, and that this is often fuelled by informal discussions that take place with students in the studio.” (Connellan 2003, p. 5)

Connecting mentally and physically into the studio was offered by Whitehouse as one way to bridge the divide. This was not just offered as a theoretical position. She cited examples of the application of her thinking and the results achieved, stating in reference to one example “It is however only through venturing into the studio that the historian learns the difference between design thinking and academic thinking.” (Connellan 2002, p. 152)

On a positive note, Connellan argues in her conclusion that there are “…concerted efforts by a few institutions to break with the norms and traditional canons of art historical practice.” Connellan (2002, p. 164) and that all the participating institutions have acknowledged the need for change and innovation particularly in establishing design theory courses that have a positive relationship with and relevance to the studio-based educational culture.
So what was found?

The following image embodies a number of aspects, which are surfacing in the analysis of the relationship between theory and practice in design from the literature review.

**Figure 10: Larson cartoon**

*Printed in the Newcastle Herald, Sat. 21st January 2006 (Larson, 2006).*

The scenario presented in Figure 10 by Larson (2006) could represent the arrival of a non-studio, theory lecturer in a design departments staff room and could read as:

“So, you’re a real gorilla, are you? Well, guess you wouldn’t mind munchin’ down a few beetle grubs, would you? … In fact, we wanna see you chug ‘em!”

But it could equally represent a design practitioner appearing at a meeting of design theory experts or more generally a group of experts from either of the two other corners (words or
numbers) of Archer’s (1979) triangular model of knowledge creation. Where the caption could read as:

“So you’re a real researcher, are you? Well I guess you won’t mind converting your treasured artefacts into data we accept. In fact we don’t want to see your artefacts just the words or the numbers.”

Just like the details of the Larson Cartoon. It is not enough to look like a gorilla. There are changes to behaviour, thinking and even taste that are required, if you don’t want to appear as a fake gorilla, in a fake gorilla suit. If the changes are not made correctly, the design practitioner will feel they are putting on an ill-fitting costume. That can create an identity problem and is an adaptation to another domain rather than an exploration of theorising based on their discipline specific experience of practice.

It is also a situation where the more one worked in a theory paradigm, primarily that of being text centric, the more one had to assume all their predilections not only to text and theoretical constructs but right down to enjoying the grubs and referencing systems.

Throughout this journey, down the Congo, into this other world-view, I still undertook artefact creation in the form of design practice. Initially it was as much a process of maintaining sanity as anything else but the foray into the land of text based theorising, or as Dissanayake, (1992) would put into a ‘text centric world view’, had familiarised even enculturated the author to this different perspective to knowledge creation and seeded the idea of exploring his own practice through the text based corner of Archer’s model.

Suitably prepared and somewhat acclimatised, the next stop on this research journey is to develop and present a plan for undertaking the research. Chapter Three will introduce the literature that justifies the use of the author as the subject of a study as well as presenting the arguments for the research plan which will guide the research conducted further down the river.
Chapter 3. Research Planning

INTRODUCTION

In Chapter 2 the literature, which backgrounds and informs the study has been presented. The ‘heart of darkness’, the presence of a theory practice divide within tertiary design education is revealed. To draw attention to the research issues present in engaging this area of research, an analogy of wearing an ill-fitting gorilla suit was given in summing up the researcher’s dilemma. It’s an analogy, it is obviously not about gorilla suits but it is about authenticity. It’s about addressing the problem of designing research, which is discipline appropriate to the design domain’s field of knowledge. The literature review leads specifically to asking the question within this study: Can the divide be bridged in a way, which leads to the undertaking of, an exploration of theorising based on the design discipline specific experience of practice?

To answer this we need to ask a ‘form’ question. What ‘form’ does design research have to be to engage in the ‘text centric world view’ of research - to use the term Dissanayake, (1992) uses to describe the primary format and focus of academic research - yet still engage practice?

The process of undertaking the literature review familiarised, indeed it was a re-enculturation into a text centric world-view, into this dominant but different perspective to knowledge creation. So despite having originally conceived this research with the desire to produce artefact centric research, the role of text has been accepted. The idea of exploring my own practice through the text-based corner of Archer’s model has been seeded; the once unfamiliar grubs and referencing systems have lost their bitterness. It is, it should be said, an acquired taste but some aspects have even come to be relished.

So this Chapter will be discussing issues related to the presentation of a research plan for the undertaking of this study. Call it a gorilla suit if you prefer but the search will be for something both fitted and acceptable to the study of both theory and practice - off the shelf would be fine but tailor-made if necessary. Starting with a discussion of the aim and proposed hypothesis of the study, the development of the research design presented in this chapter can be seen in perspective. The text will move to a discussion of the observer effect before an analysis of the use of artefacts in research is given. This will lead to discussion of
types of knowledge generation with specific reference to design research, text based forms of representing research and the issue of access.

The issues raised in discussing these topics will set conditional requirements for use in the section on the methodology selection, which leads finally to a stating of the design of the investigation instrument. This will set up the methodological and procedural requirements of the investigation to be undertaken and presented in Chapter 4.

**Restating the question**

Traditionally at this point in a PhD document the aim and hypothesis are normally restated to clarify not only the overall objective of the study, but to position the justification and logic of the design of the research plan. It is the device that is to be used for the upholding or the dismissal of the document, typically in relation to the testing of the stated hypothesis.

The aim as already stated is to explore the theory/practice, text/ artefact relationship. And that this is to be done via the design of a triptych of artefacts, which have been nominally pre-set as being a form of light or light fitting.

I would like to say the hypothesis of this thesis is $DE^Q$

But the use of an artefact to present a proposition is fraught with problems.

If I present it as text in the form of

$$D=E^Q$$

Arguing that if

$D$ represents Design

$E$ represents Energy

$Q$ represents to the power of the Question asked.

We have the proposition:

If Design = Energy to the power of the Question asked.

Then we have a proposition where the role of the questions asked is presented as having an exponential effect on the resulting design proportional to the energy expended in the act of designing.
What I have just presented does conform to a ‘What If’ scenario, in line with Fallman’s (2008, p. 5) description of research propositions in Design. This applies specifically to text-based propositions but also arguably applying to the logo (or at least the logos of the logo).

DEQ was designed as a logo for the project. It was meant to be a thought provoking visual statement. Searching for the logos of the logo, the relationship between theory and practice, text and artefact as encountered through design practice. These issues were the real intended focus of the research. And as it will be revealed in the process of delivering this chapter a combination of practice led and case study methodologies will be tailored to the imposition of a classical three experimental format for the undertaking of the research and presenting the results.

The logo could be viewed as a metaphor or even poetry; it could be a beautiful lie presented to tell a truth. My preference is to acknowledge it as a myth, created not as a truth but a position from which to set out exploring, a starting point.

Remember that even Popper respected the role and importance of myths “ Thus science must begin with myths, and with the criticism of myths; neither with the collection of observations, nor with the invention of experiments, but with the critical discussion of myths, and of magical techniques and practices.” (Popper 1972, p. 50.) This research started with a logo, a mythical invention designed to provoke inquiry and contemplation.

Popper argues we can theorise and explore the unknown depths of the world we experience. “Because we can invent myths, stories, theories; because we have a thirst for explanations, an insatiable curiosity, a wish to know…the overwhelming majority of our ideas, of our freely invented ideas, are unsuccessful; discarded as falsified by experience.” (Popper 1972, p. 96) Therein is the challenge, to propose, explore, to be curious, to wish to know. To work in a space between theory and practice, text and artefact with only a mythical hypothesis based on a logo to give the research identity.

The purpose of undertaking a project like the one I have is, in the words of Popper, to “…challenge us to observe things which we would never have observed without these theories or myths.” (Popper 1972, p. 127) So it should be understood the objective is not to prove the hypothesis as true but that the artefacts of this research prove instrumental in this delivery of research outcomes. If this is to be achieved we will start with a review of the role or the effect of the observer in research.
OBSERVER EFFECT: THE RESEARCHER AS SUBJECT

In physics the term ‘observer effect’ is used to denote the problem of changing the observed through the act of observation. The classic example being measuring tyre pressure, whereby you have to let some pressure out in order, to record the pressure existing inside the tyre but in the process you lose some pressure and the pressure in the tyre is now different to what it was before.

This is a simple example of ‘observer effect’. That which is a problem in physics gains a whole new dimension the further away from classical science one ventures. For the humanities and psychology the defining, removal, countering and adjusting for the observer effect constitutes a large proportion of the argument for and against the use of specific research methods within specific research traditions.

The observer does not only impact the observed. The observer will perceive and interpret that which is observed through a filter of prejudice and beliefs that span the full spectrum of humanities abilities to be rational and honest to the depths of self deception with or without intent. So the recognition that research is not value free must be made. The criteria for judging legitimacy and the ability of researchers to taint the quality of the research conducted have been discussed by numerous authors (Cousins, 2002; Nisbett, Caputo, Legant, & Marecek, 1973). The methodology selected will embrace a complex mixture of creative and rational processes to deal with the observer effect. But in the end will adopt a position similar to Geertz of openly admitting observer effect as being present, part of the process and make no attempt to deny or hide its presence. I will be taking his advice directing my effort “… pursuing research you can on balance believe in and writing sentences you can more or less live with.” (Geertz, 1995, p. 133)

At issue here are epistemological questions that delve into how knowledge is created and its relation to truth. Within western culture the dominant myth is that science is the bastion of the purest forms of knowledge. But it does not take long to find thinkers, even within the domain of science, that attest to the position that there is no value free form of knowing, no perfect knowing. Take Poppers stance, when he states, “What we should do, I suggest, is to give up the idea of ultimate sources of knowledge, and admit that all knowledge is human; that it is mixed with our errors, our prejudices, our dreams, and our hopes; that all we can do is to grope for truth even though it be beyond our reach.” (Popper 1972, p. 30) All knowledge is human, it does not live independently of us. Knowledge is constructed by us, to benefit us. The goal of truth is worthy but it is not a single entity that resides in a single worldview.
Well into Popper’s arguments about the nature of conjecture and refutation (the reason for having a hypothesis in the first place) as a way of moving forward in creating and assessing what we claim to know, Popper identifies language, text and the very words we use as a problem. He argues they are traditions we have slipped into without clearly identifying their unquestioned nature. Specifically “… there is certainly no reason to believe that our ordinary languages are the best means for description of any world. On the contrary, they are probably not even the best possible means for a finer description of our own physical world.” (Popper 1972, p. 213) even with the purest of intent on the part of the researcher.

The limitations inherent in text based communication constructed with words whose meanings are flexible, fluid, and so often interpretationally subtle can only be acknowledged by the researcher. Text has developed as an indispensable aid in living a human life but not specifically for communicating truth.

When text is used to pin down either design practice or the resulting artefacts through the use of descriptive statements, the required assumption is that the reader of the text is working within a common or agreed understanding of the language. It- the text, the description, is not the original but an abstraction. In the use of existing language to discuss something as difficult to pin down as design it is possible we may be in the situation described by Popper where he argues the need for a “New linguistic means not only to help us to describe new kinds of facts; in a way, they even create new kinds of facts.” (Popper 1972, p. 214) A position that McLuhan, explores from a different angle, with his statement “The medium is the message” (1964, p. 23). This suggests that the linguistic approach to the present research undertaking may be significant and most certainly should be considered as a factor in the research plan.

It is argued an inquiry where the researcher observes, records, reflects and theorises ‘for’ practice from the first person designer perspective will provide a situation where theory and practice have to be addressed. That there is no possibility to pass one task on to another person and therefore create a need for a bridge. Following a research plan that accounts for this has the potential to create a knowledge that is based in action and reflection. To access the active practiced understanding of designer and artefact, and to engage the practitioner in theorising and text-based communication forces the selection and testing of a gorilla suit. The research will have to remain critically informed and acknowledges the observer as observed legitimacy problems, but will undertake the endeavour with the intent to not intentionally manipulate the study towards a preconceived position. The use of artefacts in research will now be addressed.
The use of artefacts in research

Since research is not value free let’s start this discussion by putting some of my previous experience and by implication my values on the table. I have been engaged to design, to produce artefacts or plans for the realising of artefacts as a professional design practitioner for a wide variety of purposes and clients over my career. But there were two experiences, which deserve relating here because of their specific relevance to the use of artefacts in research. Both occurred in the 80s, when I worked as a designer for Professor Martin Green’s Research Centre at the University of New South Wales, Australia. The Centre focused on being a world leader in the research and development of photovoltaic devices (solar cells) and systems. (PV Centre)

The first experience relates to the overt text centric orientation of the ‘research’ centre. Funding imperatives and the all-pervasive mindset, towards the production of empirical results, placed the production of that which is text based at the top of the centre’s hierarchy. My job was to design whatever was needed for the PhD students to realise their research questions and allow them to publish results. This often resulted in the design of often complicated one-off artefacts that suited a specific experiment while at other times the artefacts were commercially viable as products, addressing issues present in multiple experimental and research facilities. Notably the laminar cyanide processing bench and the ‘Sun Fun’, a light-measuring unit that artificially simulated the light intensity of the sun yet could be still fitted comfortably into a standard office. These designs developed a life of their own and were turned into commercially available products.

I remember very early in my engagement in the centre being told by Dr Alistair Sproul, Senior Lecturer within the PV Centre, “If you produce the design, I’ll produce the graphs. If I produce a graph the centre gets a paper.” It was also made clear papers attracted the funds, that made my employment possible, that put money in my pocket.

There was no attempt to present the artefact that made the results possible. It was about the results. Yet the pivotal role of these specific artefacts, which were purpose built, designed for the purpose of delivering a research output, often designed specifically to address a specific research question, were actually highly valued. I received my first credit as an author of an academic paper without asking for recognition nor actually writing a single line of text. It occurred because if I had solved a specific design issue in the realising of a specific artefact that went on to produce graph-able, measurable results. There would have been little to write
about without the existence of that specific artefact. The results enabled by the design add to theorising and facilitate analysis, reflection and evaluation.

The research centre was an intensely empirical environment that cut a trans-disciplinary swathe through the traditional knowledge specialisations of physics; chemistry and engineering. The research methodologies were firmly located in the measurable.

The artefacts designed to address research questions, played a significant role in the undertaking of research within the centre. They were pivotal in the production of research. Acknowledged as a key pre-emptive element of text production, yet always playing second fiddle to the text based papers. The artefacts were the poor relations of the dominant text centric ethos of the centre.

The second situation I want to discuss also relates to artefacts, research and my experience. It also came from the PV Centre. It was 'Zhao’s Black Magic'. Dr Jianhua Zhao was a postdoctoral researcher who worked at the centre. His scientific colleagues openly referred to what Zhou could do, in the laboratory, as ‘Black Magic’. He held the world record for the production of the most efficient conversion of sunlight to an electrical voltage via a mono-crystalline photovoltaic cell. This was verified by independent testing by Sandia National Laboratories in the USA. He could and did make them on demand, and they were sold for use in a variety of projects including high profile space exploration projects.

The other scientists had the same facilities, raw materials, access to every line of text he had published and the desire to better or at least match Zhou in the production of these high value artefacts. Visiting scholars who had studied his texts came to the Centre to look at examples. They were searching for some clue that would reveal for all intents and purposes what amounted to his ‘Chef’s Secret’, the ‘Black Magic’ we referred to, that was not apparent or available in his carefully composed, studiously scientific research reporting.

Visiting dignitaries studied Zhou’s cells with intense interest, adopting the reverence of purveying diamonds in a display case. These cells were the embodiment of the Centre’s research especially by people who found the text based theorising too difficult to understand but even by those who could. Here was an artefact, an emblem, a logos, for the Centre’s existence. Indeed the images of these specific cells were incorporated into the logo of the centre. Here was an artefact that embodied meaning. Though technically without a message in the same manner as McLuhan’s (1964, p. 23) statement about the light bulb being “…without a message” yet being “…pure information…”. It is also like the light bulb in that it is an artefact that “…creates an environment by its mere presence.” (ibid, p. 8) A presence
that was close to physically dripping with stories and secrets to tell. Yet still an artefact, yet still silent.

So to me artefacts have an intrinsic place in research, but it is not enough to believe in this position from personal experience. I need to argue the position from the research methodology design and the design discipline’s perspective. So after this very personal reflection I will return to the artefact in research question by reviewing Nigel Cross’s theorising about designerly knowledge creation to position the artefact’s role in the design fields conception of knowledge.

**TYPES OF KNOWLEDGE GENERATION**

To address the positioning issue the theories of Nigel Cross will be used as a starting point. In *Designerly Ways of Knowing* Cross, (2007) expands on Archer’s three types of knowledge creation. Nigel Cross has had a long career working in collaboration with key design thinkers over the last four decades. As early as 1982 (Cross, 1982, p. 226) was identifying five key aspects of the way designers work with knowledge

- Designers tackle 'ill-defined' problems.
- Their mode of problem-solving is 'solution-focused'.
- Their mode of thinking is 'constructive'.
- They use 'codes' that translate abstract requirements into concrete objects. (Artefacts)
- They use these codes to both 'read' and 'write' in 'object languages'.

Cross (2007) is looking at design as a human activity that is far more important than a narrow professional or even artefact based understanding of design. His thinking allows the incorporation of designerly thinking into the development of the more ephemeral areas of design like the design of service, (Lockwood, 2009) or the design of experience (Shedroff 2001). So what does he mean by ‘object languages’? He is referring to the significant use of the non-verbal components of the design process from sketch models (Gedenryd, 1998, Tang & Gero, 2001), through to the ability to manipulate 3D forms in one’s head. What Archer, (1980, p. 9; 1981, p. 34) referred to as holding in “the mind’s eye.”

Cross also argues that learning how to think, how to understand and harness design knowledge is the primary role of design education (Cross, 1982, p. 226). The how to procure the ‘knowledge _ for’ that Glanville (2005, p. 88) discusses. So in settling on a suitable research method one has to consider not only the type of knowledge being generated but also the methods of both generation and delivery of the knowledge.
Cross states that when looking at knowledge one has to acknowledge or understand the accompanying culture, the set of approaches and methods that are favoured by different knowledge cultures. He divides these cultures into Science, Humanities and Design, which is very much in line with Archer’s position.

- in the sciences: controlled experiment, classification, analysis
- in the humanities: analogy, metaphor, evaluation
- in design: modelling, pattern-formation, synthesis
(Cross, 2007, p. 18)

So from a scientific perspective, analysis and exploration should be evident in a research method and likewise analogy, metaphor and evaluation in relation to the humanities’ perspective. But if you want the gorilla suit to work, to be accepted by designers we will have to incorporate or at least consider models, patterns and the idea of synthesis. The elements Nigel Cross has identified as the types of knowledge that designers use and relate to. This is not all new: The concept of pattern-formation in design has direct links back to the early writings of Christopher Alexander. But the design knowledge types are also evident in the works of Bruce Archer, Jones and Viollet-le-Duc. Where there is a difference is that Cross’s analysis goes further to associate values with the knowledge types.

- Science values “objectivity, rationality, neutrality, and a concern for ‘truth’ ”
- Humanities values “subjectivity, imagination, commitment, and a concern for ‘justice’ ”
- Design values “practicality, ingenuity, empathy, and a concern for ‘appropriateness’ ”
(Cross, 2007, p18)

And appropriateness is what we are looking for right now! The thinking expressed here is top down, big picture stuff. It engages in an ontological understanding of design in relation to the sciences and humanities. From this perspective it can be seen that design is not just graphics or the plan to create an object. It is not just artisan skills but thinking skills. It is a process with its own culture of knowledge and that concrete objects, artefacts, constitute a significant part of the knowledge in the field. That knowing and knowledge generation is often embedded in the artefacts, as patterns and codes that can be read. That the artefacts of design especially those created with research intent have value and an important position within design’s realm of knowledge. Even if it does not easily or naturally conform to knowledge generation as typically understood in the sciences and humanities.
Of course there are overlaps. A designer is not stuck in one realm of knowledge, or more specifically they should not be. There are times when ‘truth’ finding through the adoption of a scientific method or the desire to understand human experience through the use of metaphor or analogy is sensible, expedient and desirable. But when it comes to the practice nature of design the concept of appropriateness rises and within the context of an artefact’s production being appropriate becomes more important than finding ‘the truth’. Design is deeply embedded in time and the physical realities of practical action. Not the perfect, nor the truth but the appropriate. Simon, (1996) in discussing the concept of appropriateness articulates this trade-off well. A design works within constraints, which compete. For example the time frame can dictate the level of appropriateness. To satisfy one constraint there will always be a trade off with another. Not necessarily abandonment. Research is rarely the primary intent or constraint on the design of an artefact. Though the earlier discussion of the photovoltaic artefacts illustrate research oriented artefacts. From a design perspective it is a matter of objectives. You can fit four people into the modern Fiat 500 remake but it is still a squeeze, yet there is plenty of room in a family sedan made by GMH or Ford and even more in a Hummer. They are all made in the same year and there is not a truth to be found in the assessment of which design is best. Appropriate decisions have influenced the design of each car, which had different objectives.

The last discussion to be had before addressing the design of the research instrument is an exploratory way-finding in the area of text presentation. Essentially a quick skim rather than an in-depth analysis of the text based forms of presenting research - a look at previous examples of text on, about or through practice to be used as a guide to what is possible for the design of the research plan, the results and the presenting of the research as a whole.

**The text based forms of presenting research**

The silence of an artefact is profound yet the silence of a yet to be realised artefact is even more deafening.

Much of the focus in preparing oneself for a research undertaking is dominated by the expectation to become familiar with the literature. The text based forms of presenting research. In particular one has to, formulate questions and make decisions in relation to the existing literature particularly in regard to research methodologies, and establishing a relationship with a research tradition.

For a study like the present one there are a number of options to explore. One needs to assess and become conversant with grounded theory (Glaser & Strauss, 1967), phenomenology (Moustakas, 1994; Polkinghorne, 1989) and case study (Creswell, 1998;
2009; Stake 1995) without ignoring alternative options like biography (Smith, 1994; Tierney, 1993) or ethnography (Fetterman, 1989; Geertz, 1995) the options are not limitless but they can be expanded well beyond the ones I have listed. In this type of analysis the focus is typically strictly on methodological questions. Presentation is predominantly an unquestioned formal language, third person, text based, presentation of research. There are some rules for including diagrams but it is largely text based and unquestioned. There are some alternative genres available to be considered in the area of presentation, which can influence the design of the research for example, scholarly person narrative (Nash, 2004), auto ethnography (Ellis, 2004; Ellis & Bochner, 2000) and self –narrative (Chawla & Rawlins, 2004; Rhoads, 2003). These ‘alternative genres’ represent alternative models of presenting research, which do not necessitate the adoption of a detached impersonal (scientific) style of presentation. Each of the alternative genre authors listed acknowledges that to use an impersonal third person style of writing is the norm or at least the predominant convention. What they all insist on and generally used as an argument for deviation from the norm is clarity of communication. Interestingly even the act of story telling is argued as a legitimate form of presentation of research for thesis production and not to be viewed with disdain as long as the objective of clarity of communication is adhered to (Grobstein, 2005; Witherell & Nodding, 1991).

So the question is what type of presentation of research with a dominant practice focus would be preferable, acceptable, and obtain the desired clarity of communication while specifically conforming to the appropriate standards of PhD documentation? In some respects this question can be answered through observing the traditions and conventions of the methodological choices of the research designs in other studies particularly studies that are generally classified as ‘practice led’. Can artefacts live lives as fundamental parts of research generation? Yet live as text based presentations like the research output of the Photovoltaic Centre laboratories described earlier or can it be something else? A short synopsis of examples of using text to present research to design practitioners is presented before moving to the research design. Starting with an examination of examples from two previously discussed authors Viollet-le-Duc and Alexander. I will then move to discuss three more contemporary examples. Starting with the presentation of research by Dunne and Loi. This will be followed by a short discussion on the issue of access and then the final example by Whiteley before specifically addressing and setting out the research procedure of this study.

VIOLLET-LE-DUC: LEARNING TO DRAW

Viollet-le-Duc production of design related texts were prodigious, diverse and respected. One of his most influential texts is Learning to Draw or The Story of a Young Designer a detailed
account of the skills needed and how to teach someone to design, is set in the pretext of a
story. This is a fictional device quite deliberately used to deliver his ideas, his theorising with
clarity and accessibility to an often theory cautious design practitioner audience. It has a large
easy to read font size, interwoven with fine illustrations produced by the author. The book
presents as friendly and unpretentious but ends up delivering a detailed and sophisticated
discussion and advice on design without alienating the practice oriented reader. The
concepts of using story would be interesting to experiment with if the appropriate
opportunity arises in the development of the research design.

ALEXANDER: A PATTERN LANGUAGE

Alexander was also introduced in the ‘Heart of Darkness’ section because of his thoughts on
design theory. What is not picked up from a reading of the selected quotes and the
descriptions of his thinking delivered in this document is the very deliberate and specific
structuring and layout of the text he uses in his original publication of his book A Pattern
Language. It is a text presentation issue, which is easy to overlook in an analysis of why his
writing is ranked as so widely read in the field of design (Chayutshakij, 2002). He actually
articulates the thinking behind what he is doing, what he is trying to achieve through the very
design of the texts placement and arrangement. To this end he specifically states;

“On reading this book.
What lies in this book is perhaps more important as a whole than in its details.
If you only have an hour to spend on it, it makes much more sense to read the
whole book roughly in that hour, than to read only the first two chapters in
detail. For this reason, I have arranged each chapter in such a way that you
can read the whole chapter in a couple of minutes, simply by reading the
headlines, which are italics. ... Then, if you want to go into detail, you will
know where to go, but always in the context of the whole.”
(Alexander, 1979, p. 1)

When you compare the language of A Pattern Language with later books, The Timeless Way of
Building (1979) or The Nature of Order (2002), the ideas presented are not a major shift in
direction but none of them have the same text presentation impact of the package of design
elements used in the book A Pattern Language. Whether I can use or even experiment with
the text presentation principles used by Alexander or not, I would definitely like to capture
his intention of accessibility through multiple entry points and the individual sections or
chapters being self contained yet ending up with a document where the end product of text
and artefact is “…perhaps more important as a whole than in its details.” (Alexander, 1979,
p 1)
DUNNE: DESIGN NOIR: THE SECRET LIFE OF ELECTRONIC OBJECTS

Dunne’s PhD work *Hertzian Tales* (1998), which was the catalyst for his book *Design Noir: The Secret Life of Electronic Objects* (2001) is one of the few PhDs to make it to print as a commercially available book. So it easily requires inclusion in this review. Regarded as a prime example of ‘Practice Led’ ‘Design Exploration’ it is engaging and inspirational as a model for undertaking research in design. I have not seen the original PhD document (Dunne 1998) but have read his later 2001 book version. It is presented in the smaller medium octavo format (9.5 x 6.8 inch) which is less daunting than the formal A4 hardbound format of typical thesis documents and invites comfortable reading.

Putting presentation to one side, the content presents a journey, an exploration of ideas. There are links that compel the reader to continue, to read on, to mentally join in on the search to explore the ideas presented. The association between text and artefact (he produced both for his thesis) is in some places deliberate while in other places it is incidental and unplanned. Interestingly Dunne has clarified what he was doing by stating, “…that the exploratory projects should not be considered as necessarily illustrations of the ideas discussed in the essays, nor are the essays an explanation of the proposals. Instead, they evolve simultaneously and are part of the same design process.” (Yee 2009, p. 7) In Dunne’s example of a PhD presentation, we find a melding of theory and practice, yet at the same time a decoupling of the relationship between text and artefact that produced a deeper more profound relationship. A situation where both artefact and text amplified and became extensions of ideas in the other as components that could stand alone but worked better as a set.

LOI: SUITCASE THESIS

Loi (2004) presented her PhD in a suitcase, which contained “… found and custom-made objects, CD, images and instructional notes.” (Yee 2009, p. 9) I read about it but its artefact nature makes it something that interlibrary loans departments cannot and will not consider moving. The idea is so exciting I want to see it, I want to engage with it but there in is its fundamental disappointment for me. Accessibility. The major influence of this example of a thesis which would appear to deal with, possibly in detail, possibly in a new and exciting way, the issues of theory and practice, and quite probably the issues of artefact and text is the accessibility problem.

I made the pilgrimage to see the thesis and enjoyed my time contemplating the contents of the thesis. This intricately interwoven mix of text and artefacts, which as a set, as a complete single entity, a thing, a thesis were inspirational and re-enforced my quest to pursue my own research.
Figure 11 Loi’s Suitcase Thesis

The figure shows two views of Loi’s thesis, which was presented in a suitcase. He explores wonder, play, the idea of packing and unpacking but despite the unconventional physical presentation, the structure of a standard thesis is evident. His justification for the approach he uses can be found in the simple statement “…I could not portray my research without using the same tools and methods I advocate in my work.” (Loi, 2004, nb)

Though I enjoyed the whole notion of making a pilgrimage to see the thesis. Access was the only issue that detracted from its shine, it was not only a personal frustration; it (access) is a major issue for knowledge dissemination for this type of research. Access is such a big issue that it will be discussed before presenting the final example in this review of the forms of presentation of design research.

Access

I have explored the library holdings of special collections of Universities in Europe, the USA and Australia. In some cases Carnegie Mellon University Pittsburgh for example, despite having an extensive collection of Design Masters, they had no Design PhDs in their library at the time of exploring their holdings. The Scandinavian States and Turkey had identifiable collections but were predominantly written in languages I was not able to read. The exploration of the Royal College of Art London (RCA) Library’s special reserve section was by far the most fruitful and the opportunity to review the collection was arranged over two separate trips to London. I looked for and at Design related research particularly in the form of PhD thesis documents and because of the way the books are accessed at the RCA, the number of previous readers of any specific research selected was also available. Thesis that presented research about practice and artefact production rather than those that pursued a distinctly historical or theoretical position were by far the most read or at least from the
records I saw the most requested. Peter Dormer’s PhD “Wishful Thinking: A thesis on skill and studio crafts” was the most popular of all the research documents I looked at. It had been read/requested every year since it was written in 1992 and the major theme it addressed was: Why do some people put the idea before the making while others do the opposite. He deals with practice “… tricks, the meritorious [sic] and the skilled.” But also laments the “… awfulness of work that is knowledgeably well made but which is somehow irretrievably wrong because the original ideas were wrong.” (Dormer, 1992, p. 210)

This confirmed not only the interest in practice-based studies but there was a genuine interest in the theorising of practice by a researcher who understood or came from a tradition of design practice. Texts in this area are becoming easier to access as the influence of digital deposition of completed thesis becomes more common. The issue of what to do or how to handle the associated artefacts is still somewhat of an open question. Some of the boxes I opened at the RCA, full objects, drawing, videos and associated artefacts had not been opened for considerable lengths of time. Travelling to London to see an artefact sets some extreme limitations on the accessibility of the knowledge generated and its ability to contribute to the advancement of knowledge within a field.

To this I would like to reflect on my own experience of preparing, packing, re-assembling and presenting one of the light designs presented later in Chapter 4 in a peer-reviewed exhibition in Helsinki. While unbelievably beneficial in progressing the research in terms of interacting with like-minded researchers, interacting with the exhibited artefacts and the theoretical discussions that grew out of such a meeting of people and artefacts. It became clear to me there is nothing like seeing the real thing. A real interaction with an artefact such as Sarah Casey’s ‘Patina’ which is ‘drawn’ by “painstakingly mapping out with a syringe to issue carefully moderated deposits of grease.” (Casey, 2009, p. 4) comes to mind.

![Figure 12 Detail of Sarah Casey’s ‘Patina’](image)

**Figure 12** Detail of Sarah Casey’s ‘Patina’

A detail of Casey’s ‘Patina’. An image made from the very grease, which an artist would normally fight to keep away from an artwork.
Figure 13 Sarah Casey’s ‘Patina’

The figure shows two views of Sarah Casey’s ‘Patina’ (2009b). One finished hanging in a gallery and the other during production as she lays down measured applications of grease to create the desired image. But the images do not successfully convey the transient nature of the image, which could only be seen from certain angles requiring light to pass through in order to be seen yet the light would cause the breakdown of the image. An image made from the very grease, which an artist would normally fight to keep away from paper. So the very notion of ‘Patina’ was a contradiction, which challenged the viewer.

But the flip side of this is how fundamentally trapped into text-based presentations of research we really are because of access and distribution realities.

Digital data storage and presentation provides some promising opportunities and something in this line may be attached to the thesis because an exhibition has a limited accessibility and availability. Despite my passion for artefacts, the document which records the DEEP study needs to stand alone in much the same way that Dunne's thesis does. The artefacts he produced were fundamental to the research yet their lack of physical presence does not detract from the reading of the text-based presentation of the research, which developed in collaboration with the interaction with the design research artefacts. This brings me to the Power Point thesis—the last of these exposés.
WHITELEY: POWER POINT THESIS

Graham Whiteley presented his PhD thesis in the form of a Microsoft Power Point file, specifically because “the thesis should be accessible to a wider audience” (Rust & Wilson, 2001, p. 4) and by doing this, his thesis, his words and images of his artefacts are much more visible and accessible than could ever be achieved via a single exhibition presentation to examiners.

“…our approach has also unlocked the problem of ensuring that a full record exists after the examination-arguably this is a fuller record than many Science PhDs which do not provide unequivocal evidence of any practical work which was carried out.” (Rust & Wilson, 2001, p. 8) As boring as the mental image, the mention of Power Point presentations may conjure, the concept and arguments provided by Whiteley have resulted in what should be an easy to access PhD thesis. Unfortunately the original Power Point file is no longer easy to access and it appears to have been replaced with a PDF file, which may or may not be in the original format.

Figure 14 Whiteley’s Power Point Thesis

The figure shows four slidelpages from his thesis (Whiteley, 2000, pp. 6-1, 6-8, 4-2 & 4-22). The text is obviously too small to read but the images are presented to give an impression of the importance and prominence give to the visual imagery used in the thesis presentation. On every page in all six of the main chapters of the thesis there was an image located at the top of the page with text located below.

The format is basically uniform throughout the document except for the conclusion and interestingly for some reason the method section, which does not appear to follow any form of pattern in its layout. Every page in every other section of this thesis starts with a picture, often quite complex at the top of the page. The text comes second and created a variety of page lengths. This placement has impact as this format is repeated through more than 100 slides/pages. Where Whiteley’s artefacts are given a prominence that champion their role in
research in a way that demystifies through addressing the access and distribution issues that plague so much of the artefacts based research outcomes produced to date, I am not convinced that utilising Power Point as a presentation system for my thesis would be the most appropriate in this case but it is a bold initiative that is thought provoking and highly commendable in its ‘what if’ nature.

WHERE DOES THIS LEAVE US?

The articulation of practice into text inherently distorts the described into the structure of language, and by default into the socio-cultural understanding of the text by the reader. This will vary depending on ‘texts’ perceived value within an individual’s perception. In relation to the theory practice divide there is a degree of gorilla suit fitting needed on both sides. The text needs to engage practitioners not just fellow theoreticians. But practitioners should also be prepared to try suiting up, often enough, to feel comfortable in this different skin. Hopefully familiarity will lead to engagement, even excitement about the possibility of exploring design from a theoretical perspective.

Keeping or re-enforcing the position of a theory/practice divide that can’t be bridged is unproductive. It needs to be challenged and will only be bridged by making progressive attempts to illuminate and expand our collective ability to express what we do and what we think in words, through text.

From discussing the forms in which research is communicated and the debate surrounding creative disciplines it can be seen that this problem is not isolated to artefacts and design practice. Rust points this out, referring to all the creative disciplines, by stating “In all cases there is concern about the forms for communicating research…” Rust and Wilson (2001, p. 23)

Despite having shared understandings and an identified ability to interact and engage with artefacts (Cross, 1982) we are left in a situation where. Without the aid of a shared disciplinary language that can be expressed in a non-text form yet has the accessibility and distribution convenience of text, for example, that musical notation has achieved. We are left with text. Therefore text will form a significant portion of the communication of the study. Elements of issues identified in the preceding section will be incorporated into, not only the considerations of how to present the thesis but also influence the undertaking and design of the study. The research design will now be discussed.
The design of the investigation research instrument

Texts on methodology selection privilege the hypothesis/answer format in knowledge creation. Sullivan (2010, p. 36) refers to the “canonical status” of logical positivists. Though there is room offered through the establishment of multiple research questions offered in less scientific disciplines, the presumption is for an outcome, a deliverable. For a practice-oriented person considering the idea of engaging in research this results in a pre-assessment and a removal from a study, practice possibilities that do not conform or do not lend themselves to be suitably documented. It can become a case of self-editing to expressions of design which lend themselves to or result in an articulate-able outcome or deliverables.

This study will attempt to avoid this self-editing procedure. The process undertaken will be reflective, iterative and generative. Some may argue that this thesis works at the boundaries of what constitutes a postgraduate thesis but then again this is what Loi (2004), Scrivener (2002) and Sullivan (2010) argue postgraduates in art and design should be doing.

In considering the epistemological and methodological issues of the study, the relationship between text and artefact, which as a focus could be regarded as an issue but is itself not a question and therefore will not produce an answer, only a response. This is OK. Popper identifies the importance of bold propositions in the search for knowledge. Stating “The most important function of observation and reasoning, and even of intuition and imagination, is to help us in the critical examination of those bold conjectures which are the means by which we probe into the unknown. Although clarity is valuable in itself, exactness or precision is not: there can be no point in trying to be more precise than our problem demands.” (Popper, 1972, p. 28)

The ontological question of what is real in this document will take a relativist position, that it is “socially constructed and exists in many forms” Sullivan (2010, p. 38) and to answer the questions that arises in the undertaking of this study. The following criteria for methodology selection is specified: A methodology that allows the complexity of the physical actions and the thinking entwined in design practice to be recorded. That allows the exploration of the topic to be conducted with both depth and clarity but without, as it were clubbing the topic to death with words.
The types of research methodologies available, off the shelf so to speak, for this general type of study has been short listed to Phenomenography, Narrative Biography, Grounded theory and Case Study. A short description of each methodology will be presented before a selection is made. It should not be seen as a competition between rival academic tribes vying for converts, but it can often appear that way when encountering disciples of specific methodologies.

Typically examines experienced phenomenon. Often in the context of classification and comparison, which leads to analysis, which identifies hierarchies whether, they are formed from generalisation or not. The objective is to identify, compare and sort experienced phenomenon into generalise-able descriptive sets.

Narrative Biography: Authority Denzin (1989)
Typified by engaging in the documentation of the lives of individuals. Usually involves the interview of individuals cross-referenced with archival records. Though as a type of research stories are accepted the objective is to reveal patterns within a context often within a specified timeline.

Grounded theory: Authority Strauss & Corbin (1990)
Typified by the use of data sets to analyse a specific topic or interest. Predominantly achieved through high number of interviews, which are less detailed than either Phenomenography or Narrative. Extensive use of coding and matrix tables to facilitate comparison of data with triangulation used as a method of validation of results.

Typified by the in-depth specific analysis of a specific situation or situations. The methods of actually conducting the study are more eclectic in the acceptability of source materials than the other methods. Specifically there are examples of using artifacts as source materials. Comparison of details is the typical form of analysis used with an objective to identify generalizations through the identification of patterns.

THE ENVELOPE PLEASE

The decision goes to ‘Case Study’. Highly influential in this was Richard Buchanan’s recommendation of the use of case studies not only as a research method but as an educational tool in design specifically because it can bridge the theory/practice divide. He
states “Case studies have a rich history for exploring the space between the world of theory and the experience of practice.” (Breslin & Buchanan, 2008, p. 36) He identifies that for design this is difficult because “…the principles underlying the design process are not well documented, articulated, or agreed upon.” (Breslin & Buchanan, 2008, p. 36) Partly because it is difficult, partly because of the range of activities in which design processes are used but he also states practitioners regard design process “…as privileged, propriety information” (Breslin & Buchanan, 2008, p. 37) which they do not want to reveal, make public through the articulation of principles, or theory and that “This secrecy does not lend itself to in-depth examination by outsiders.” So maybe an insider has to develop a taste for the grubs, put on the case study suit and enter the ‘swampy ground’ that Jonas (2000, p. 48) identifies as the domain area of the study of design practice.

**BUT THERE IS MORE!**

This research will also be practice led, or as least it will resemble the definition presented by Gray (1996, p. 3) “research which is initiated in practice, where questions, problems, challenges are identified and informed by the needs of practice and practitioners; and secondly, that the research strategy is carried out through practice, using predominantly methodologies and specific methods familiar to us as practitioners.” There has been an increase in the use of this form of research methodology as evident from the review conducted by Rust, Mottram and Till (2007, p. 54) which identified 15 institutions which provide training in 'Practice led' research. It was not included in the earlier ‘The contestants are’ list because it is relatively new and less established at least in comparison to the methodologies that were listed. Practice led research can quickly become entangled in academic turf wars between methodologies which have a lot in common yet arguments about details can end up in protracted debate about differences both perceived and imagined. Two of the other methodologies that are similar to ‘Practice Led’ are ‘Practice Based’ and ‘PBE’ (practitioner based enquiry). To avoid confusion I will stick to the Practice Led title because it has the most referenced citation in citation searches and heading towards becoming the dominant term in this field of research. That said all these methodologies fit well to the undertaking of ‘Design Exploration’, as illustrated in the Fallman model (2008, p. 5), to address design research within a context of design practice.
Fallman (2008, p. 5) illustrates the different aspects of design activity with a particular emphasis on positioning Design Exploration as being a different activity to Design practice and Design Studies. In particular Fallman makes the point that ‘Design Exploration’ while similar to ‘Design Practice’, which has a commercial orientation, differs by exploring ‘what if’ questions.

What is of particular interest is Fallman’s positioning of the purpose of a design. ‘Design Exploration’ while similar to ‘Design Practice’, does not have a commercial orientation. ‘Design Exploration’ explores ‘what if’ questions. The distinctive difference is “…primarily due to the perspective from which the artefact is being constructed.” Fallman (2008, p. 7) ‘Design Exploration’ is not typically market or user driven, it can explore outside of established paradigms of commercial practice providing an artefact that embodies what is possible, a ‘what if’. “In this way, the activity of design exploration is clearly linked to some of the ideals of contemporary art, as well as to the interpretative attitude of many humanities disciplines.” Fallman (2008, p. 8) It is a matter of how the artefact is perceived in the process of conceptualisation. Remembering that Sullivan argues, “…perception is not a mindless sensation. …it also plays an active role in conceptualisation.” (2004, p. 19) So the way we frame our perception during the act of design will affect the outcome and if we design with the purpose of the production of an artefact which interrogates the question (Durling et al, 2002, p. 82), it will have also conformed to Durling’s ideas on artefacts in research.

That said Durling does not argue that the artefact is suitable to submit in itself for the gaining of a PhD. Though there are some who have argued this position. Colin Painter from Wimbledon School of Art is said to have taken this position as has Chistopher Frayling but this has been refuted (Durling et al, 2002, p. 9) the best argument for implying the
embodiment of knowledge in an artefact comes from Biggs (2004) but he does talk in terms of potential rather than providing specific examples.

Yet to consider the artefact’s position in relation to research is to embrace the ability of research to explore uncharted areas of thinking rather than just following established pathways.

**The Mapping of the Procedure**

It was suggested in the introductory, Chapter 1, that there was a disjuncture between theory and practice. This was substantiated in the reviewing of the literature presented in Chapter 2. To allow this study to progress, an outline of the logic and structure of the research instrument to be used in the next chapter is now presented. The research method conforms to the classic description of case studies. There are three cases presented, each case presenting the response to a change in the question being asked in the effort to produce the design of three separate lights.

The ‘question being asked’ is a reference back to the $\text{LE}^{20}$ but each light, each individual case study, is an exercise in practice led research using Fallman’s (2008) model of Design Exploration where the artefact interrogates a question (Durling et al 2002, p. 82). So this research follows some of the conventions and constructs associated with science. Notably, having a control and repeating procedures. It also refers to the field of social sciences with the use of case studies and the problem solving procedural nature of an undertaking with the aim of producing outcomes. In this case the production of designs for, a triptych of lights, a triptych of artefacts. But what is desired is ‘insight’, what is desired is new knowledge, that comes out of practice and the questions that are generated in the process of practice. Though the outline of the three experiments has similarities to a classically structured scientific experimental process the objective is not to produce a pastiche of science but to take the research either into the broader “new territory” that Sullivan (2010, p. 76) discusses or the space between fields of knowledge, the “swampy ground” that Jonas (2000, p. 48) explores. Why, because within this research the act of practice, design practice is intrinsic to the production of knowledge, intrinsic to the production of data, thinking and the artifacts.

The first light can be viewed as a control. It follows a relatively standard approach within design practice. The artefact itself was the focus created out of desire to create an artefact. The analysis of the artefact being a post analysis in the form of an exegesis, which utilises the literary style of story telling, to expose the now silent message embedded in the artefact’s creation. Post analysis is highly typical of design explorations (Sless 2003, p. 2). This case
The study follows a narrative case study method but the focus is not on what happened in a technical sense. It does not cover the typical areas of material selection and manufacturing processes. Instead it has investigated the idea of story as a mechanism for revealing the silent language of design. The ideas embedded in the artefact by the designer. It is exploratory in the sense that the result is not known. It must also be recognised that there may be resistance to such an approach to the examination of a designed artefact in this manner. Especially the creation and use of stories which can be collected and examined because, as Buchanan warns the “…designer may be reluctant to believe that there are universal ideas to be extracted from these stories.” (Breslin & Buchanan, 2008, p. 38)

The second light is a design, which was undertaken after the recording of an experience in the form of an exegesis (words in Archer’s model). This is in contrast to the method of design utilised for the first light design where the design was produced before the recording of the exegesis. For the second design the experience to be explored is my participation in a jury. This experience was selected because it provided an experience rich with thoughts and emotions. It was also a discernible unit of experience, which can be argued to be discrete from the typical manifestation of design practice. Recorded as an experience, in text without reference to its possible design potential it was subsequently used as the starting point for the creation of a light design. The procedure also provides the opportunity to contemplate the role of judgement in the design process.

The third design is an exploration of the relationship between text and artefact that grew out of the contemplation of the first two experiments. It was always the intention to undertake a third design to complete a triptych of designs, because a third design provides a triangulation in terms of research methodology in relation to the original and second light designs. Yet at the start of the study the direction of the third experiment was not clear. Only that the line of enquiry did already have a logo as a reference point.

The experimental aspects evident in the establishing of this procedure is inherited from science where it is taken for granted that a fixed procedure is outlined and established to be used throughout an experiment. Design practice in contrast assumes from the start that the implementation will evolve and that there will be continuous refinement not only in the developing artefact but also in the procedure, even the research design.

The changes are not only expected but they mark the iterations of a design in the process of being designed. The individual artefact is being designed while the study is also being subjected to a designerly approach to the undertaking of research.
The important element to capture in this research is the thinking embedded in the artefact rather than the procedural elements of the artefact’s production. The texts desired should deliver an exposé of the designer’s thinking, and thoughts in relation to the artefacts. Each case study is undertaken to allow the researchers audience to evaluate the credibility of the conclusion drawn.

**Taking the next step**

The next chapter will report the results of applying the investigation research instrument presented in ‘The Mapping of the Procedure’. The three case studies presented are the text manifestations of a physical practice-engaged in/for the purpose of research. They are the ‘findings’ in the classic sense, the results. The rendering in text of the silent language of design embedded in but not heard from the artefacts. The artefact exists before the text, even despite the text.

As Buchanan states “The possibilities of theory should not be lost on designers. Theory can provide opportunities to grow in one’s practice by exposing previously unseen connections and relationships, as well as providing context for understanding changes that already are happening.” (Breslin & Buchanan, 2008, p. 39)
Chapter 4. Results

INTRODUCTION

“The world is but a perpetual see-saw. Everything goes incessantly up and down – the earth, the
rocks of Caucasus, the pyramids of Egypt – both with the universal motion and with their own.
Constancy itself is nothing but a more sluggish movement. I cannot fix my subject. He is always
restless, and reels with a natural intoxication. I catch him here, as he is at the moment when I
turn my attention to him. I do not portray his being; I portray his passage…
I must suit my story to the hour, for soon I may change, not only by chance but also by
intention. It is a record of various and variable occurrences, an account of thoughts that are
unsettled and, as chance will have it, at times contradictory, either because I am then another
self, or because I approach my subject under different circumstances and with other
considerations.”
(Montaigne, [1576] 1958, p. 235)

That Montaigne’s thoughts are available to us today is a product of him taking the time to
record them with frankness and with an accessible style of delivery. He identifies the slippery
nature of observation and the presence of change, but sets out on his journey of exploring
and recording. He makes judgements, tests them but in the end trusts that at the time of the
penning of his thoughts they were a true and an honest account of his deliberations on the
subjects he encountered.

Given the problems of self-analysis acknowledged in the literature review, I take both
inspiration and solace in Montaigne’s example. The way he makes intellectual speculations
that merge into stories, his use of first person and his sincerity. I too embark in good faith
and honest heart to provide the three, Practice Led, Case Studies of design practice
undertaken for this research.

The first, reports on the design ‘Umm’ it is presented using the Eventyr as a mechanism for
revealing the silent language of design and was written after the creation of the artefact. A
case of ‘Artefact before Text’ it can be viewed as a control. The second and third designs are
variations on the initial ‘Artefact before Text’ experiment.

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Eventyr: A Danish word, meaning short story or a set of stories but "adventures" is arguably the better translation.
Hans Christian Andersen called his stories Eventyr is has been assumed that it meant ‘fairy tales’ but this is not the case.
‘Ury’ the second design used a procedure of ‘Text before Artefact’. This was achieved by the production of a text centric recording of an experience. This ‘text’, was used as the catalyst for the creation of the second design and the text based reflections that together provide the second case study.

The third design grew out of the two preceding studies. Not out of the desire to create a third design but from the questions that arose in the design and execution of the two preceding artefacts and their associated text. The third design grew out of the undertaking of the research. It uses a ‘What if’ question to explore the logos of the logo LE².

**FORMAT**

In this chapter the triptych of designed objects and their respective accompanying texts, that are the results of the three, Practice Led, Case Studies are presented. Therefore the reader will find that the chapter divides reasonably evenly into three parts.

For ease of identification the three case studies use the name of the featured artefact in the title of the study. There respective relationships are:

- Case Study No. 1. Umm Artefact before text Starts page 72
- Case Study No. 2. Ury Text before artefact Starts page 89
- Case Study No. 3. Umlaut Text and artefact in unison Starts page 104

Because of the subject matter, that they respectively address, they have been written to stand-alone as pieces of writing and are presented as such. Each individual text centric piece of writing relates to the accompanying artefact, which has been produced specifically for the thesis submission. Each section will start with a cover page with a set of images relevant to the design followed by the accompanying case study text. The analysis of the three studies as a set will follow in chapter 5. Additional materials relating to the three designs, which can be found in the Appendix section located at the end of this document and in the Appendix DVD located in a sleeve attached to the back cover of this document.
Case Study 1
‘Umm’
Figure 16 Explanatory notes for Case Study 1 ‘Umm’ cover page

1. Concept drawings, the seeds of an idea, produced while working in Colle Val d’Elsa, Italy.

2. Drawings of proposed layout of interlinked Static Concentration PV modules.


4. Cross sectional view of photovoltaic panels showing the roof mount overlap and alignment.

5. Ray tracing testing an a hand carved glass lens base/

6. Internal reflection principle diagram, light enters the top surface, is reflected off the bottom surface at an angle that guides the light to the solar cell by mean of internal refraction of the top surface.

7. Ummms in production waiting patiently.

8. Doodle by Roger Quinn produced during a discussion about the relationship between theory and practice in design

9. Umm being exhibited.

10. Picture taken of sun setting in Volterra, Tuscany, Italy. In the way that photographs and notes of the experience of the expedition to Italy tell a story and trigger memories. In this way the Umm become the significant silent embodiment of the research undertaking of this case study.
Case Study 1 ‘Umm’

Artefact before Text

INTRODUCTION:
The first study can be viewed as a control. The design of the light, ‘Umm’ follows a relatively standard approach within design practice. The artefact itself was the focus, created out of a desire to create, with the analysis of the light, as an artefact or as an act of design, being a post analyses. Post analysis is a highly typical approach within design (Sless, 2003, p. 2) there has also been the tendency to present within design case studies, exposés of the features and the technical problems encountered. This analysis will not focus on technical and production details. What this analysis will do is utilise the literary style of story telling to expose the now silent message embedded in the artefact’s creation.

To do this, the introduction you are reading will be followed by some context setting, an aperitif before the presenting of the story Umm and the Matchbox: The Object of Desire and the Desired Object. This short story, or as I would prefer to call it an Eventyr, is a very specific style of text production I am experimenting with. The Eventyr is then followed by an epilogue which expands on the earlier contextual investigation of Andersen’s use of text within the context of the studies’ attempt to let ‘Umm’ have a voice.

The design of Umm was undertaken without any text production in mind. The first attempt at revealing what lay behind the silence of this particular artefact, was the chance, challenge put forward by a ‘Well Travelled Man’ who was taking delivery of an ‘Umm’. He was lamenting the lifeless monotony of a selection of conference papers on design he was reviewing. He threw the challenge at me “What would you do and how would you write if you wrote not only about one of your designs but for it?” My response was I would investigate the writing style of H.C. Andersen, and undertake an honest yet admittedly inferior attempt at animating the inanimate like Andersen has done so successfully with spinning tops to handkerchiefs. I took up the challenge, you will encounter the results of my efforts soon enough but first some notes from my investigation of Andersen.

SOME CONTEXT WHILE THE READER SETTLES IN FOR THE STORY
When Hans Christian Andersen wrote ‘The Little Match Girl’ (Andersen, [1845] 1976) he was not writing a product endorsement for matches. Far from it. But we have been left with a glowing example of the animating of an artefact and how the brilliance of a humble match
can be manifested through the use of the written word. The experience may have been fleeting, but the euphoric pleasure experienced by the girl was real.

This first case study explores the idea of love being embedded in a designed object. That notions of love, pleasure, importance and childish naiveté are all context-driven. As designers, we must understand that context is not always in our control; that our designs, like our children, will live their own lives. Love is found when the moment is right, when events align.

This happens despite our planning and skill, or our analysis and rigour. The core of this case study is, wrapped in the style of an Andersen-esque story, which looks at the relationship between two objects. One, an Umm, is desired, enjoyed, treasured, and the other an ordinary matchbox. Barely noticed let alone contemplated.

While it can be presumed that most people understand what a matchbox is, it cannot be assumed that they understand ‘Umm’. Such an assumption would be rather bold, even though the text of this section follows an unusual path or maybe simply a less-travelled path. If it is desired that we will all make it to the other end without becoming lost along the way, some of the ideas will need explaining. This preamble will have to start by addressing that question you are already asking; “What the hell is an Umm?”

Umm was not designed to be presented, either graphically or as text. It is an imposing piece of skilfully formed glass, designed to be experienced through intimate visual, even tactile, exploration of its form. It subtly and playfully evokes the beauty of a fertile female body. The product design, though conforming to standard safety and functional criteria for a light of its type, does more.

It has been designed not only to create an affective response from the public; it is an affective response to the emotions and events that have brought pleasure to the designer’s own life. The design becomes a tangible manifestation of the link between his two loves, his family and his profession. But why use an Eventyr, why not just deliver the facts, produce a report. To this question, at this point, an aperitif is provided because of the bulk of the reflection you will have to wait for the epilogue.
There is a mystery, an openness of interpretation that in essence is the very pleasure, the joy, found when reading a story as opposed to a clinical report. The effort to analyse every detail and labour every point would end up being the academic equivalent of clubbing the experience to death with words.

Woods points out, “we cannot explicitly summarize human ‘attitudes’ or ‘postures’ in a comprehensively linear mode of representation such as text. An important feature of design practice is that it is rich in non-linear attributes.” (Wood, 2000, p. 50) But at the same time this is precisely what is being attempted and therefore the choice of a story format is being used in this case study to convey the relationship between affectiveness, pleasure and an object’s design.

Language is an issue here. Csikszentmihalyi says, “…the written word allows us to understand better what is happening within ourselves. In recording real or imaginary events, the writer arrests the evanescent stream of experience by naming its aspects and making them enduring in language…thus understand more accurately how we feel and what we think. Fragile thoughts and feelings are transformed by words into concrete thoughts and emotions.” (Csikszentmihalyi, 1997, p. 238) Though I agree with Csikszentmihalyi and can attest to the better understanding and concretization of my thinking through the act of
writing. The form of the text was also critical. The use of the Eventyr presented itself as being a creative exercise in itself yet allowed the building and layering of meanings in text.

The Woods and Csikszentmihalyi quotes identify apposing views, so any attempt to capture the process of creating a design, of quantifying the pleasure or affective component of a design into text, must acknowledge it is dealing with a very fragile, flexible entity. This entity could be lost or reduced to dry words of no real value to the understanding of either the issues or the designed artefact. According to Wood, “In the academic context the idea of ‘rigour’ stands for ‘logical accuracy and exactitude’ and derives from the Latin word ‘rigere’- to be stiff. As such it has come to signify not only strict enforcement of rules but also great harshness or austerity.” (Wood, 2000, p. 48) How does the relationship between text and artefact find room to be explored in such a context? It can’t. Therefore the next section not only follows the format of a story, it is a story, but it is more it is an Eventyr, an adventure. There is detail; there is honesty and pleasure certainly for me but hopefully for the reader as well. Hopefully in the process “Fragile thoughts and feelings” are also captured. The emotion and thinking instilled into the design. And the Qs of 

To prise out the knowledge locked into an artefact, in this case an Umm, at the moment it finally leaves the furnace. In the process of doing all this, this Eventyr also presents a reflection upon the ever-changing positions of the object of desire and the desired object; the Umm and the matchbox. Enough already, you have waited long enough and are now quite settled in.
There was a well-travelled man of taste and discernment, who being well travelled had seen many things, as travellers do, or so I am told. And so it was that these exploring eyes did spy a lamp the light of which did please his eye. First impressions have their affect, so his desire for the object took root. The reason for this story is based crucially on that instant, that initial first reaction. For I am the artisan who created that object of desire, of pleasure, but without the meeting with this particular travelling man, the events as set out would not have occurred. The story could well be another story altogether. So in time it came to pass that I was summoned to the gentleman’s residence to present the lamp, whose name was Umm. Umm preferred her name pronounced with the ‘u’ of beauty not the ‘u’ of mundane. This was important because she was a proud lamp, proud of her heritage, and she thought these things made a difference.

Umm took her place in the house of the well-travelled man. She was placed on a pedestal, a commanding position from where she could see the comings and goings of the household. It was a happy house, neither grand and overbearing, nor cold and sterile. Umm was happy to find herself placed in such a prominent position in such a distinguished house. You see, this object of desire knew her value. She was the product of love, and even though she had no facility to talk she spoke the language of the unheard, a silent language reserved for objects that capture and impart desire and pleasure.

She was proud of her lineage: she had sisters who had enticed their way into other places of importance, fulfilling their destiny of being an object of desire. Dispensing their
affective power. Waiting silently, expectantly, to catch the eye of the passing beholder. Umm enjoyed enticing the eye with her sleek lines, allowing the eye to caress her form, until deep in the viewer's heart the cup of joy or desire would take its fill, sometimes only taking a sip, sometimes requiring the noisy slurps of rushed attention, until a point was reached, where a slight cracking of the lips occurred, sometimes producing an 'ah', sometimes an 'oh', sometimes rendering a slight sense of embarrassment or a giggle, but always leaving the sweet taste of pleasure on the viewer's lips, taken straight from the alchemist's cauldron of pleasure. She embodied that secret formula. She knew she was more than beautiful. She could cast that spell but she was more. She was made from the purest sands from across the Tasman Strait, combined with exotically pure colour extracts from the north of New Zealand. From her very conception, long before she was born, she was destined to bring pleasure, to be special.

She was conceived in Italy between Florence and Siena, in the sleepy remains of the medieval town, Colle Val d'Elsa. The town was perched on a rocky outcrop, the business centre of the town having apparently slid down the hill, creating a new piazza for the town folk to meet and play. This had occurred during the Mussolini years with its resulting implications for the architecture. The old town centre still existed, supporting a few traditional glass blowers, but was presently being invaded by Germans and Danes 'snow-birding' the winter in the exotic remnants of its old world charm. From its earliest days Colle Val d'Elsa had always been, and still remained, a glass crafting centre, a centre of excellence and innovation, where ideas were exchanged, created and given form. Umm's creator, the artisan, was there both for those reasons and also to learn more, more about the mysteries and science of glass. But this was no longer the Middle Ages. To the east of the township was a huge factory where the artisan spent most of his days, not a Dickensian monstrosity but a modern facility,
clean and organised. It continued the tradition of local glass production but followed the worship of technology and the pursuit of efficiency.

During the day the artisan learnt from the masters the wonders of working and manipulating the liquid crystal we call glass. During the day the glass was dealt with as an inanimate material, observed and recorded with scientific rigor for its matter of fact properties. But at night, the ambience of the Tuscan Hills mixed with the lessons of the day. In Italy it is impossible not to see beauty. It is captured at every turn, in the little nuances that can turn a mundane thing into an object of desire. The little touches. And so it was that the seeds of an idea were planted in the mind of the artisan. It started as a simple dimple in the forming of a glass. Something that captured the voluptuousness of a peach with the cheeky beauty of Italy’s finer sex.

It may have stopped there, but the artisan had been busy planting seed elsewhere. His lover was with child; he knew this as every day her shape changed as the external surface of her body grew to accommodate the love that grew inside. Umm was growing as well, though both offspring were still nameless at that point. Developing in unison, the artisan’s notion would develop into an object that would try to capture - as well as is possible without insulting Beldame Nature 6 - to evoke the beauty of life in formation. In due course the artisan returned home, but the concept for Umm had taken hold. He searched out other artisans to help him as this was not to be any object, but an object of desire; and like a birth it would be difficult, an undertaking where, because of skill and experience, many things were known. But in the end, like childbirth, it would venture into the unknown, it would be risky. This piece needed to capture an idea, a notion; to embody desire, not simply to execute a function.

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6 Beldame Nature: Variation on bel- grand (as in grandmother), from Old French bel/beautiful and the Latin bellus + dam mother, variant of dame. The term is used by Milton but the implication is of one not to be trifled with because she can be malicious if insulted. (Hill, 1976)
The furnace was lit, the artisans gathered. It was time. A crystal of white was selected. Not any white; this white had to be the colour of clouds, of dreams. The colour of beauty, clarity and hope. Not hard or sterile. A white that allowed light to pass through it and impart desire, presenting a glow that asked the viewer’s mind to stop and linger, caress the form and savour the moment. To this was added layer upon layer of the purest Tasman crystal. Impurity was banished. Like layers of meaning, a new coating was added with each passage through the furnace. In the stifling heat, the artisans performed a dance, an industrial ballet, poised and positioned in a precisely orchestrated performance between the fires of danger and desire, catching and throwing, teasing and manipulating the slow formation of the subject of their energy, their thoughts and desires. Passed from one artisan to another as it grew, they scrambled onto elevated work platforms to give Umm a size which reached the very limits of the artisans’ ability to carry on. Then she arrived. They could go no further. Artisan and object ceased their frenetic activity, satiated, and cooled off in their respective ways.

The Umm is a complicated affair: capturing simple elegance has never been as simple as it appears. As the artisans gather to admire the fruit of their labours, her affective life has begun.

Located as she is now, prominently in the room of the well-travelled man, Umm beams forth its message of desire to his many guests. She is proud of her position as pleasure giver. From her vantage point she notices that some guests also give pleasure; some come only for business; still others merely clutter the room for a while and are gone. She comes to realise that the difference between objects and people is not so great. Some are useful, some are for show and yet other guests serve no particular purpose at all. They are a dime a dozen, like the matchbox, which has been left thoughtlessly on the coffee table. To her they are simply
clutter. From her vantage point she contemplates the dilemma of the matchbox, an object of mass production. She looks at the matches with pity, using a condescending eye. Soldiers of uniformity who march forth on a short, tawdry life, like many common objects which are to be found everywhere; uncared for, often lost, forgotten and discarded. Utilitarian yes, but not created as an object of pleasure or desire. She laments the sorry predicament of the matches.

This line of thought consumes the Umm as she basks in her elevated position, illuminating the room, casting her light on the other characters that make up these four walls and a roof, which the well-travelled man proudly calls his home. She amuses herself by ranking the collected objects in order of their ability to provide pleasure to the master. There is the comfy chair, the picture that was on the wall only the other day but having lost favour was gone in an instant, the TV and the remote. Oh, the remote. Hideous little upstart! Forever running away, and the cause of no end of fuss. Desired yes, but such a love-hate relationship. And the matchbox, sorry excuse of a thing that it is. Cast into a position of prominence, but without care or deliberation.

Then, without warning, she felt her light source fade. Through the window she could see her elegant cousins, the streetlights, also dimming in unison. Finally, the red dot on the TV was also gone and she was left in total darkness. As disconcerting as this was she was not panicked; she recognised it as a blackout and settled herself down to wait it out. These things fix themselves you know, they always do.

A key finds its way in to the door lock. It turns. The tumblers click, the door opens, a switch is flicked, a grumble ensues. The master scans the room, tracing the imagined outline of Umm in disappointment. He sees only the fused dark form of nothingness. The couch and the TV have become one. He looks at the space where a picture had
hung, but despite the darkness, knows it is no longer there. He is worried about standing on the remote, a pesky creature that could be anywhere. He surveys the ground ahead but sees only the black amorphous void where the entirety of his treasured objects meld into one. He estimates the location of the coffee table and by stealth moves forward to the right hand corner. Using his hands as eyes, he searches for the matchbox. The object of his desire. He caresses the form of the box to find the top and enter inside, careful not to spill its treasured contents. “…ritch!… how it spurted and blazed!” 7 A match burst forth with light, losing his life to please his master.

The master’s collected objects are all there, in their places as they should be. By the light of the match, his eyes caress the Umm. For the first time he sees her not in her intended luminous white. She has picked up the splutters and fizz of the match’s ignition. There is a definite reddish hue, like a blush. The thought occurs to him that the Umm is embarrassed as he sets off in the direction of the kitchen in search of a candle.

The room is now dark again. The Umm is humbled. The ability to give pleasure is a fleeting thing. At present it dances on the tip of a matchstick, wafted with each step by the air that surrounds it.

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7 The line is a direct quote from The Little Match Girl (Andersen, 1976, 122). It is deliberate and should be acknowledged but the actual placing of the reference details in the text did not appear appropriate to the Eventyr format.
EPILOGUE

Animating the inanimate, a matchstick cannot speak, but it can inspire. The Umm is an artefact, it may be proud, it may have a story to tell but she needs a storyteller. There is no text without the writer but artefacts can still engage people through needs and desires with or without text. Those artefacts that speak directly to people in the full glory of their silence show their designs mastery of this language. Hans Christian Andersen was a master at this idea of speaking directly to people. He did not dumb down his message; rather he enlivened it by using techniques that allowed him to engage with everyone. There are lessons in design to be learned from reflecting on Andersen’s style and approach. Consider his use of duplicity to ride the tension of play between the use of conversational tone and his application of studied effect. We too should understand that our objects, designed for the giving of pleasure, must long to engage the viewer in conversations, many of which will be intimate. Andersen’s stories constantly question perspective and try to place understanding, the ability to understand, in a larger context. For instance, beauty and happiness are delicately placed with different layers of meaning by a simple conversation between a Mayfly and an Oak Tree:

…if one of the tiny creatures rested from its blissful play for a moment on a large oak leaf, the tree always said, "Poor little insect! Your whole life is but one day long! How sad!"

"Sad?" the little May fly always answered. "What do you mean by that? Everything is so bright and warm and beautiful, and I am so happy!"

"But only for one day, and then all is over."

"Over?" said the May fly. "What does over mean? Is it also over for you?"

"No, I shall live perhaps thousands of your days, and a day for me lasts a whole year. That is something so long you can’t even figure it out."

"No, I don’t understand you at all. You have thousands of my days to live, but I have thousands of moments in which to be happy and joyous. Will all the beauty of this world die when you die?"

"No," said the tree. "It will probably last longer, infinitely longer, than I am able to imagine."

"Well, then, we each have an equally long lifetime, only we figure differently."

From a translation of Hans Christian Andersen's *Det gamle Egetræes sidste Drøm*, (*The Old Oak Tree’s Last Dream*, Hersholt, 2011)
Andersen allows us to see, through the all-too-human thoughts of the Oak tree in relation to the Mayfly, the blind spots created through the adherence to a viewpoint of life that is (what should I say?) normal or rational.

The inspiration for using a matchbox as the other object in the ‘Umm’ Eventyr came from a reading of The Little Match Girl (Andersen, 1976). How this tale came into being is a story, which is worth telling. “The Little Match Girl was written after seeing a picture of a girl selling matches in the street; the original drawing was made in 1843 by J.T. Lundbye … who sent it, together with two other engravings, to Andersen, with a request that he write a story for whichever of the three he preferred… This is, in fact, the only known case of a picture inspiring Andersen to write a story.” (Bredsdorff, 1975, p. 350)

Though inspired by a picture with no direct relationship to himself, the picture arrived by chance. The story he develops comes from deep within him, and embodies feelings that are very close to his heart. “In H.C. Andersen og hans Eventyr (1907), Hans Brix suggested that The Little Match Girl contains a reminiscence of a story that Andersen’s mother told about the cold and hunger she herself had suffered as a child when she was required by her parents to go out begging.” (Conroy & Rossel, 1980, p. 261) This understanding invites the questioning of the relationship between pleasure and pain, both as a contrasting agent used in the creation of a design and as an understood phenomenon within the psyche of the designer. In our un-romantic age, where we are far more clinical about nearly everything, we can forget this struggle exists; but then again most of us do not produce timeless, creative masterpieces of Andersen’s calibre. Through his experience of great pain he has created great pleasure. Andersen appeared to be very aware of this relationship: Grønbech describes Andersen’s demeanour during the creation of The Improvisator (Andersen, 1976) as “being in that confused state of mind that often, in a creative artist, is a sign that something new is on the way, a new work is about to be born; a condition where hope and doubt coexist. Birth or miscarriage? Can or cannot?” (Grønbech, 1980) Risk is an integral part of the production of design, and has been acknowledged as important by the positions presented by Jonas and Meyer-Veden, (2004) and Nelson and Stolterman (2003).

Instead when we discuss the production of design, we often present “…the worship of technology and the pursuit of efficiency.” (Quoting from the Eventyr, p. 80), we focus on the “…observed and recorded with scientific rigor for its matter of fact properties.” (Eventyr, p. 80) But it is important to remember that historically, many of the seminal designs that evoke pleasure, that still speak to us today come from people who felt deeply about things. These people show more than a normal curiosity, and have a heightened capacity to experience
pleasure and pain. Csikszentmihalyi, in a discussion about the impact of inherent or natural curiosity on the output of a creative work states, “This kind of interest is rarely only intellectual in nature. It is usually rooted in deep feelings, in memorable experiences that need some sort of resolution – a resolution that can be achieved only by a new artistic expression or a new way of understanding.” He also makes the case that, “An intellectual problem is not restricted to a particular domain. Indeed, some of the most creative breakthroughs occur when an idea that works well in one domain gets grafted to another and revitalizes it.” (Csikszentmihalyi, 1997, pp. 87-88) This can be seen in Andersen’s work, not only his deep passions but also his ability to cross over between domains, even into that often lost domain, a child-like perception of the world.

Is this the way to animate the inanimate? The way to reveal, to articulate, the depth of feelings, the actions and the memories embedded through design into an artefact. The questions the design answered, the questions asked. When we cross from artefact to text do we need to re-enter the child-like understanding of the world?

“Andersen kept through life the child’s pleasure in descriptive detail that appeals vividly to eye, or ear, or, even tongue. The Little Match Girl is the mind’s release into an illusion of pleasure from a body too starved and wretched for further endurance. It has the brightness not of sound imagination but of fevered dream.” Robb argues that it is the way Andersen treats the inanimate. It is his ability to render the inanimate so “They are true to life, yet more vivid than our ordinary perceptions…” It is this that allows him to give “A sense of strange life clings even to inanimate objects.” (Robb, 1968, p. 124) It worked for Andersen, the inanimate have had no finer champion (Eighth most translated author in the world, 3171 known translations)(United Nations, 2011) but his written texts use other distinctive features as well. He typically does not embed a moral into the story; he lets the allegorical and ironic levels impart meaning. This distinctive feature of his writing, a move away from the type of fairy tales produced for the French court by Charles Perrault and his contemporaries, (Perrault, 1697) writers of stories like Cinderella and Little Red Riding Hood. Andersen’s texts invite an expanding perception of the possible rather than dictating a prescribed reality.

The French tales followed a pattern, whereas Andersen enters into a conversation, in much the same way as we do when we encounter the objects we find in everyday life. These are encounters in which we are left to draw our own conclusions. The designer’s ability to influence the ‘viewers’ perception is significant and crucial. But it is more like instigating a conversation than providing a direction. Robb contends that it is Andersen’s descriptions that entice us into his presence. “Andersen’s descriptions are thus significant, with a beauty or a terror that shines through the material objects” (Robb, 1968, p. 128) whether they are
real or imagined. He captures and presents for us “…the queer secret life that may enter into inanimate objects, and possess anything from a porcelain figure to a darning needle.” (Robb, 1968, p. 128) Just to entertain the notion that what we design can have a secret life of its own opens our mind to new perspectives.

His stories despite their strangeness, express living thought and feeling, just as our designs should. The beauty of Andersen’s art is that he reveals ideas through the private imagery of children, which allows a fundamental joy of life to be experienced or even re-experienced. The experience consequently shines through, because it is not encumbered with the superficial cares of the adult. Stories allow us to perceive with clarity, yet understand that whole which often eludes definition. Put simply, life is complex and so are our designs. When we think in terms that a child can understand: using their language, we are allowed to re enter, as Robb says, those “… rare intervals in which life, holding, as it were, all its elements in solution, is so illuminated for us, that we see it no longer as the aimless sequence that it often seems to be, but as a whole in which everything has its appointed place, and from which no atom falls away. Imagination and experience, knowledge and faith are, for a shining instant, perfectly attuned.” (Robb, 1968, p. 153) This is where there is a harmony between the feelings embedded in an object, the viewer and the outer world.

So what else can be said about the way Andersen presents his ideas? In an analysis of the difference between *The Ghost*, an existing Danish folk tale also known as *The Dead Man’s Help* (Bredsdorff, 1975, p. 310) and *The Travelling Companion*, (Andersen, 1976), Andersen’s reworked version of the tale, Grønbech (1980, p. 90) argues that the two key elements to the success of the reworking are, “First, he put into print spoken language with all its inconsistencies of logic and syntax”, (Grønbech, 1980, p. 89) and secondly “… he removed all those words and expressions, particularly the abstract ones, that only adults used.” (Grønbech, 1980, p. 89) Both are principles Jonas argues should be utilised when exploring the relationship between text, design and theory, (Jonas & Meyer-Veden, 2004, p. 41)

Does the design of an artefact, which follows this same formula capture the same spirit, but in a tactile form? This gives rise to a second question, since Andersen so often successfully described and rendered the inanimate object with life, should it effect how we write about our design? Is it that, as Grønbech suggests, “The simple, pseudochildish narrative style is no more than an intriguing disguise, a refined naïveté permitting irony or seriousness to have a stronger hold.” (Grønbech, 1980, p. 92) Whether it is a trick or not, understanding how the interlocking of inanimate artefacts with significant text based personas is derived from childish instincts opens the doors to a greater understanding of how designs can be perceived and indeed how the silent language of design can be communicated.
It would be easy to dismiss Andersen as a dreamer, all caught up in the fairies. “Danes are frequently taken aback to discover that in the Anglo-American world Hans Christian Andersen’s tales are considered to be only for children.” (Mitchell, 1957, p. 155) It is we who place the ‘fairy’ connotation on his work, it is we who are uncomfortable with the peculiar and unique literary relationship he establishes between reader and listener. We bolster our own intellectual position by looking down at his apparent stylistic naïveté.

Andersen stopped using the terms ‘fairy’ or ‘tale’ after his first publication, referring to his later creations as *Eventyr* or ‘adventures’. Mitchell states that Andersen’s writing as a whole “…evinced admiration for technology and the resolution of practical problems by the human brain. This materialistic attitude is not a trait of what generally is called ‘the Romantic school’” (ibid, p. 119) and though famous for his fairy tales, “During his lifetime he was by no means principally concerned with writing tales and still less with writing for children” (ibid, p. 150)

The rendering of a story, an *Eventyr*, about the design ‘Umm’ but really *for* ‘Umm’, in the Glanville sense of creating *knowledge for* design, to explore and “to see what would happen if…” (2005, p. 87) It should not be viewed as a fairy tale, a romantic folly. Umm the artefact is speaking, as best she can, with the aid of text, through the collaborative effort of artefact and text and a practitioner prepared to theoretically contemplate practice.

“The reader who overcomes his prejudiced belief that Andersen is only for children, and who undertakes to read the tales, will find a never-ending source of pleasure.” (ibid, p. 160) Designers who take the time to reflect on the possibilities opened through an exploration of the secret lives of their designs will be better equipped to encourage their designs to deliver their story through the silent language of design. They may even successfully deliver something that is text based.
Case Study 2
‘Ury’
Figure 18 Explanatory notes for Case Study 2 ‘Ury’ cover page

1. Handwriting from the notes, which formed the text component, used in this case study. Created before the Ury design was started.

2. Looking at Ury from underneath.

3. Close-up of noose knot, which supports the glass and carries implications of the seriousness of the judgments asked for.

4. Four images of Ury illustrating the external satellite light source’s relationship to the whole design.

5. Close-up of the satellite light source’s construction and configuration.

6. Ben Edols preparing to place Ury back into the furnace.

7. Pencil drawing of a re-interpretation of the Logo created during this case study. The variation was later incorporated into an animation used in the Helsinki exhibition.

8. View looking up through Ury. Viewing Ury from this angle has quite an unusual contemplative effect. The light source is external, Ury glows like there is a light inside but the view inside is clear. From this one can contemplate the preferred way to undertake a judgement or even what would we see if we were looking out from Plato’s cave.
Case Study 2 ‘Ury’

Text before Artefact

PREAMBLE

This case study follows a different approach to both artefact design and use of text to the previous case study No. 1 Umm. In this case study the concept of text before artefact was postulated as a desired exploratory position. Initial attempts at instigating research from this position were fraught with problems principally because of the engrained nature of text as a post design activity.

The concept was nearly abandoned when an unplanned event happened. I was summoned and selected to serve on a jury. It was not something I had chosen to do; indeed I had made efforts to avoid it. The interesting thing from the studies perspective was how rapidly I was enveloped in an experience quite removed from my normal design activities, this research and my life in general. The experience was intense and all consuming while it lasted. The experience of jury duty was undertaken, which was followed by a recording of a text-based contemplation of the experience. The text itself evolved from a cathartic purging to that which is presented here. A reflection upon the concepts of ‘process’ and ‘judgement’, brought about by the experience of being a member on a jury. It is the sum of these activities in text production that produced this reflection on the role of judgement in relation to process. The philosophical framework of ‘judgement’ as a legal concept is not addressed but the paper draws implications for enhancing the designerly understanding of design process particularly within design education.

A design practitioner typically understands their design process and the judgements they make during design as a heavily entwined experience. Models like Broadbent’s (1988) ‘Spiral Model’ and the more recent model by Swann (2002) emphasise the repeated returning to key points in the design process where judgments are made that often redirect the focus of the process. The models illustrate a highly interactive process where the designer has an enormous influence on the direction of the design process and the design solution that ensues. Hundreds of judgements can be made in the execution of a single design.

Contemporary design process theorising by Nelson and Stolterman (2003) and Fry (2004) explore in greater detail the judgment aspect of design thinking. This is brought to bear on the experience of being physically embedded in a trial process where one was a component rather than a designer/author of a process. Where the role of judgement was dictated as the
jury’s primary task and their influence on the process was minimal. This is in stark contrast to the role a designer normally has within a process. The comparison provided insights into the different roles of process and judgement particularly in relation to a designers understanding of process and judgement within the design process. This case study creates a text first which discusses the implications with specific reference to design educators and design students in the understanding of their own design thinking.

In contrast to the previous case study this text was penned before the artefact was designed (Text before Artefact). A final draft existed (very close to what you read now apart from some minor edits in style and tense to make the text conform the larger text formats of this thesis) before the design of the ‘Ury’ was attempted. Therefore it can be argued that this design has grown out of a text centric reflective process.

EXIT JURY DUTY

Twenty-four hours after delivering the verdict and being released from jury duty. I worshiped the porcelain, in the loudest most cathartic manner. It was almost as if this allowed the vocalisation of a full throttle yell to purge the pent up emotions of the experience.

Waking after an extended sleep a recollection of the experience was penned. Six thousand words emerged with surprising ease. It was not a paper. It had more in common with the exegesis students create when undertaking ‘Practice Based Research’ (Sullivan, 2010, pp. 221-2) or “Reflective Practice” (Schön, 1987) methodologies, following a process that, as Scrivener (2002) argues, creates artefacts for the purpose of research, for gaining knowledge and understanding. That “… brings into existence artefacts that have to be interpreted.”

The document is an interesting read but it was not intended to be a document, which is made public. It was however the starting point for a productive reflection on the experience which argues for and clarifies the role of judgment in a designerly understanding of the design process. With implications both personally and from an educator's stand point. To start this reflection a short synopsis on design process is presented before reengaging in the experience of the jury process.

DESIGN PROCESS

A design practitioner can identify the words, ‘process’ and ‘judgement’, as separate entities but in the normal run of professional life experience they would be experienced as heavily intertwined. Absorbed into the contiguous, seamless, flow of design practice. There have
been many models that have been used to explain and theorise the design process. Broadbent's 'Spiral Model' (1973) provides an early example.

Figure 19 Broadbent’s Spiral Model

Broadbent's, (1988) ‘Spiral Model’. The spiral path of the process is used to plot design activities. Between the 'concrete' and the 'abstract' we have to decide. Between analysis and synthesis we have to evaluate. In both cases judgments will need to be made. Despite Broadbent not using the judgement word in his model he does acknowledge it later stating “Evaluation, traditionally, is a matter of experience and judgement...” (Broadbent, 1988, p. 259).

Judgments are called for as the issues of a specific design move from the abstract to the concrete. The model can be used to represent a component of a design or a design as a whole. It presents a model of design as having a developing path towards a solution.

The model presented by Swann (2002, p. 53) provides a more contemporary representation of the design process. In the tradition of models proposed by Jones (1970), Lawson (1997) and Cross (1992). The Swann model represents a process where ideas are explored, revisited, redirected. A process involving multiple points of judgment that intrinsically influence the direction the process pursues. The practitioner is intimately involved in judgments about the process selection and the judgements that direct the design process as it progresses towards the realisation of a solution.
Figure 20 Swann’s Iterative Model

Swann (2002, p. 53) illustrating the stages or iterations of a design process with arrows moving from left to right. The arrows moving from the right to the left indicate the constant revisiting of the different stages typical of a design process. Judgements are an integral part of such a process, when to go back, when to stop, what to revisit and how much time to allocate are all judgments.

THE JURY PROCESS

Jury duty followed a prescribed process, which was run with clinical precision in comparison to the design process. The word clinical may appear inappropriate but every aspect of procedure was controlled, where to sit, when to sit and if one person needed a toilet break, everyone on the jury was ushered out of the courtroom until that person was ready to return. The clinical aspects are also evoked by the sense that all the parameters of the process you’re embedded in are set out in minute detail. An abnormal experience, from the perspective of personal norms, but for the major players of the attending judiciary their behaviour and the process they follow was indeed normal. The clinical precision and orderliness of the process had overtones of a laboratory rat experiment of Skinner-esque proportions. Where the jurors are allowed to explore but only within the confines of a pre-defined process. Except that the jurors are instructed to make no judgements about possible directions, they are indeed encouraged to refrain from making any judgments until the process has finished, until the process had run its course.

Judgments about validity of evidence and a persisting desire to apply prägnanz the ‘Law of Closure’ (Sternberg, 2003, pp. 92-95) come into play. The desire to create a whole, a neat mental model from the sometimes-disparate vignettes of information was evident in both myself and in other jurors. Also evident was the desire to create an intelligible construct that was identifiable within our individual understandings of legal and societal systems. Despite any prejudgement musing that may have taken place by individual jury members, it was
performed in silence if at all. Though a dominant percentage of the proceedings were directed at us, we as a group had no impact on the direction of the unfolding process.

The process meandered along despite the obvious confusion and frustration evident in the faces of different jurors at different times. All the jurors passed comments about how strange an experience it was. Comments varying from feelings of claustrophobia to the sensation of being on an endless carousel at an airport where the aeroplanes never takes off. Sit here, move, sit, stand, wait, listen carefully to the announcements, wait, move, sit, ad infinitum. Though obviously engaged in a process with a stated role of making a judgement. The control or directing of the process was not our role. This was in marked contrast to a designer’s role in a design process.

CONTEMPORARY THINKING ON DESIGN PROCESS

Nelson and Stolterman (2003) and Fry (2004) explore judgment as a key aspect of design thinking. Design process is a term often used and referred to by design students, academics and practitioners. This contrasts with the term design judgment, which is not as often specifically referred to. It is simply understood as an inherent part of the design process but by not isolating it as a critical and independently identifiable entity its pivotal role and the opportunity to develop judgment as a skill, particularly in an educational setting, is neglected.

Designers, be they students or professionals, do not easily come to a full understanding of judgment’s position in what they do because it is intertwined with process. For students the mistaken belief can take root that process, in itself, can produce design. Design students may require a catalyst that forces the disentanglement of judgement and process. For myself the experience of being physically embedded in a process, the proceedings of a murder trial, established by custom, precedent and law, where the input to the process was effectively reduced to zero except for the final judgement, proved to be a catalyst.

The atmosphere created in the jury process resembled a clinical or scientific experiment where the role of judgement was isolated in a way that made it distinct and observable. The trial was not an experiment. There was not the intentional or purposeful planning this would normally entail. Nor was there ethic clearances to negotiate, typical of today’s academic requirements. Despite this, the procedures and delivery of the trial created a situation with many similarities to an experiment.

Consider the randomised selection, a controlled environment, and a clearly defined process, which leads to the extraction of a discernable result. The objective of the “experiment”; to
determine what the collective judgment of the twelve subjects would be after being engaged in the experience of the process.

NELSON ON JUDGEMENT

When Nelson discusses judgment he works within a systems approach to an understanding of design. Making judgments is a very normal part of day-to-day activity. It is a fundamentally human activity and often aligned with reason. Nelson argues that in today’s environment of hyper information availability, it is logistically impossible to achieve a comprehensive understanding. Comprehensive being the objective when applying the power of reason but there is a catch. He states “Those who continue to cling to the belief that comprehensibility can be achieved will invariably experience analysis paralysis.” (Nelson & Stolterman, 2003, p. 124)

Some jurors made great effort to follow, indeed stick to the application of rational analysis, but were often lead down a trail of an ever-growing list of questions and possibilities. It was interesting to watch the pursuit of unfettered rationality create a knot, which could not escape the need for the making of a judgement. There are limits to the ability to better understand something simply by trying to absorb more and more information. Especially when trying to understand a complex reality or another human's perception of such. Which was the key element of the defence’s argument. Students need to be made aware of this and learn how to deal with the inability to comprehensively cover complex realities and utilise the power of judgment. As Nelson (ibid, p. 260) points out “Judgements are always made in the absence of perfect knowledge,”

FRY’S MODEL

Another person who has reflected on the design process is Richard Fry. His approach to modelling the design process has been to produce a tool for analysis, particularly self-analysis, of individuals who are engaged in design practice, and his particular focus has been to create models that “identify personal strengths” (Fry, 2004, p. 87). Using the model in Figure 21. He has identified contributing factors, of particular interest to the study, in the bottom right hand corner there is ‘Judgement Theory’.

The advantage of this model is that when it is adapted to map an individuals design process a visual representation is available of the different activities being utilised. Using the three worked examples presented in Figure 22 it can be seen how the area identified with Judgement grows in importance as the designer’s career progresses.
Figure 21 Fry’s Design Process Model

Fry’s ‘Design Process Model’ (2004). In his model he sets out an overlying structure to manage the tools used in design.

Figure 22 Worked examples of Fry’s model

Three worked examples of Fry’s (2004) design process model. The layout of the contributing factors presented in Figure 21 is reconfigured to represent the proportion of use in designers at different stages of their careers. The increase in the utilization of the judgment area by more senior practitioners is clearly evident.

It is the quality of the judgements made that steer the designs we produce. Schön argues, “The designer's role becomes that of integrating the results of inquiry…” (Schön, 1974, p. 197).
but it is not simply a matter of integration. A large percentage of the problems designers deal with have been classified as ‘Wicked Problems’ by Rittel and Webber (1984) which by definition have no clearly defined rules for when the problem is solved or whether the solution presented is correct. A judgement is required and making that judgment is a learnt professional skill. Students not only have to learn of the need for judgement but how to make and when to make them.

BACK TO THE TRIAL

A murder trial carries all sorts of connotations. Amongst them is the idea of getting to the truth, through the pursuit of perfect knowledge. As the trial progressed fellow jurors remarked on the feeling of being lead, blinkered and deliberately denied information. Frustration would surface when legal council would ask seemingly irrelevant questions while appearing to deliberately avoid an apparently obvious question. Creating areas of (deliberate) imperfect knowledge. There is no implication of misconduct here. It is assumed that there were specific and legitimate legal reasons but information was edited and withheld for example. The jury remained out of court while a morning was spent in legal arguments over which images the jury was to be allowed to see. After this was settled the jury re entered court to receive a collection of about 30 images with a numbering system, which went to 170 indicating a large cache of missing images. They could have been image duplicates but it did not appear to be the case.

The comparison can be made here to the classic scenario described in Plato’s ‘Allegory of the Cave’. (1993, pp. 240-247) The deliberate creating of a single perspective worldview, despite the equal time available to the prosecution and defence the total view presented is limited in the same way as the shadows in the cave. It is from this single perspective that the twelve subjects were invited to make a collective judgment. The jurors received such a specifically apportioned set of informational experiences that there is a sense of groupthink established. When there was disagreement within the jury on the validity or impact of a specific piece of evidence, it was difficult to argue that one somehow possessed additional information because all the contributing evidence and arguments were delivered in unison.

FACTS, FACTS AND MORE FACTS

There was a desire by some jurors to go on gathering facts obsessively. You may have encountered either a student or colleague exhibiting similar traits. Whether this was a desire to avoid having to make a judgment or a belief that there is a point where a group of accumulated facts will miraculously produce a judgement is not known. The cause can only be speculated but their behaviour has resonance with the thoughts of Valsiner (2001).
In particular a lecture he delivered at Sydney University in 2002 where he expanded on the 2001 paper. He lamented the current state of research process amongst PhD students. Pointing to the fishing for ready-made theories and solutions instead of building their own. Comparing this student behaviour to the perusing of shelves in a supermarket looking for ready-made packages with promises of ‘just add water’ or ‘heat and serve’. The argument is that we (the current generation) have developed highly tuned consumption skills, which elevate the ability to make a choice between pre-packaged items of limited difference into an important decision. This has been done with a consequential atrophy of production and process skills. To use a simple example, your ability to select a shirt is highly developed but do you know how it was made or how to make one yourself? Relate this to what we do when we make a judgement and consider if you are just selecting between what has been offered off the shelf. Do you know how a judgment is made, how would you construct your own judgment?

There were no shelves in the jury room, no ready-mades to pick-up, no aisles to peruse. Judgement was the only task, it was individually and collectively mandated. The process provided information about the alleged crime, the context, and the people involved but assumed the skills of making a judgment existed as a given. This assumption situation is argued to also exist in design education. Process can often overshadow the crucial role of judgment. How to make and use judgment being left as understood. It is not disentangled from ideas about process nor understood as something that is made not just selected.

Returning to the trial and the concluding of the judicial process, that which happens in the jury room, the judgment of guilty or not guilty. The jurors were civilised but this only barely provided a thin veneer, which covered the palpable possibility of a real ‘Lord of the Flies’ (Golding, 1958) type scenario. So much in the end depended on the judgment individuals had made on how to frame the uniform information that had been presented. There was discussion, argument, and persuasion. There was reverence to logic and reason but values and beliefs carried as much weight. Nelson points out in his discussion of design thinking “The reasoning and logic behind an accurate explanation of the existing are not the same as the logic and reasoning used to determine what is desired that does not yet exist.” (Nelson & Stolterman, 2003, p. 165) In the jury room until there was a unanimous judgement and there were two days of existing in a state of unresolved tension, there was no release from the singular responsibility of making a judgement.

JUDGEMENT

Until one is confronted with separating judgment from the other intertwined activities that constitute our thinking, judgement remains confused with the other activities. Nelson who
has reflected on the issue states, “Judgement is, by definition, an elusive animal. It is as distinct from rational decision-making as it is from intuition. Judgment has practical, pragmatic value and academic legitimacy, without having to be codified and generalized, as science demands on behalf of its cousin reason.” (Nelson & Stolterman, 2003, p. 181)

As a result of the courtroom experience I have drawn the following educational implications from the reflection. Postulating that when we identify a student as gifted, or when we discuss a student as having a sound understanding of design process, are we actually diagnosing the presence of effective design judgement without acknowledging it? Making students aware of judgements role in the design process will give them an insight, an advantage for engaging in future design practice. It will enhance their design thinking. The lesson for students is that decision-making can be based on reason, reason is a tool, but reason does not make a judgment.

My part of this reflection is over. Its usefulness or applicability will be a judgment you will have to make, but as Nelson states, recipes and rules are not what create quality design. “Rather, they are the outcome of judgment.” (ibid, p. 127)

**EPILOGUE**

The preceding text, which is provided as the ‘pre’ artefact, text component of case study 2 was finished and printed off at the time the Ury design was conceived. This is to say that the exploration of a suitable design response had not started earlier, there was a deliberate effort not to. The mind did want to wander into well establish patterns of exploring design possibilities but for the sake of the experiment the focus was on creating the text written up to the point where this epilogue starts and not starting the design of the artefact until that section of text was finished.

Despite this deliberate plan of action, a number of ideas emerged, literally popping into ones thinking in a most distracting way. They were ignored and not used but they were surprisingly easy to dismiss because the act of writing, the concentrated energy required to bring the text to the state of a final draft. Inhibited the concentrated energy required to address the design of an appropriate artefact. It was not until the final addition of a small section, which rendered the text section complete that the artefact design was engaged. Interestingly the final addition was a short deliberation on the similarities of the jury experience to the world construct described in Plato’s ‘Allegory of the Cave’. Only when this was completed did the text feel finished. Once printed the process of artefact design was started. The process proceeded very quickly, arguably because a substantial proportion of the thinking, questioning, theorising that had precedes the normal engagement of the design
process had already happened. The Q’s were well developed. Interestingly it was that final section on the Cave allegory, which provided the pivotal key in the production of the design of Ury.

Ok, so that just leaves me with the problem of how to represent the created artefact in a document like the one I am working with now.

I could provide a technical report.
I could just present a photo and let the silent language of design do its work but would this be appropriate or even adequate. If nothing else this experiment really shows how post artefact text is needed. Like a debutante arriving, Turning up is not enough, at a ball an introduction is needed. The debutante like an artefact exists with or without an introduction but an introduction allows them both to realise their full potential.

May I now introduce Ury.

She is of good stock. Ury is the second child of three sibling designs, progeny of the happy union of Sir Text and Lady Artefact who currently reside within the contemplation grounds of DE°

Figure 23 Ury is presented despite Sir Text’s objections

*Despite Sir Text’s ambivalence to the changing role of artefacts in society Lady Artifact arranges the distribution of invitations with the following text; Sir Text and Lady Artefact request the pleasure of your company at an Exhibition Tea in honour of their daughter URY within the contemplatory grounds of DE°*
Figure 24. May I present Ury

1. The Ury design utilises glass as the major component but incorporates a mixture of other materials including an external halogen light source housed in a milled stainless steel mounting point. It explored the concepts of proportion, position and perspective as aesthetic references as it grew out of what at first appeared to be a very limiting text based starting point. The glass component is 60cm high with a 20cm diameter. The whole light has a 100cm diameter footprint.
Please note her figure sports a 4/8 ratio in the bodice, which is the same ratio as the deadlock in the jury after the first day of deliberation.

She has attached herself to a rope of standard appearance but fashions the rope into a hangman noose and proceeded to support herself from her waist so she hangs from and balances upon that 4/8-ratio point.

The light source is external. Putting the light source on the outside re-enforces the ideas of detachment, of distance, of creating an observer’s perspective and it facilitates the creation of shadows (a reference back to Plato’s cave). As a result of moving the source of illumination to the outside, a lens-less telescope, a device for applying focused attention can be created out of the central component of Ury. It may blinker peripheral issues but it does not impede the observation of anything placed in the central viewing point. It may distort, or limit the possible points of viewing but no more than the observing available in either Plato’s cave story or from the jury box and as such the design of Ury becomes the physical manifestation of the ideas and issues presented in her pre-design text. The clear passage through the light, a clear line of sight, neither interrupted nor distorted, this is what we want to see when making a judgment. So in bringing this deliberation on the experiment to a conclusion. I will return to the debutant analogy and contemplate the original purpose of presenting ‘real’ debutants.

Traditionally young ladies of debutant age were presented because when they exited the application of a set of constrictive upper class social practices, notably a boarding school education and a prohibition on dating and general socialising. The girls had effectively had their charms and character concealed and their public voice silenced. The use of a formal announcement countered, even rectified this situation. It proclaimed that the debutant wanted to meet with her peers, interact with them, even with potential suitors.

So it is with artefacts. The traditions and customs of many practitioners keep many an artefact cloistered in a state of text-less-ness.

Waiting quietly for the opportunity to be formally presented, introduced. It is neither the fanfare that is longed for nor the obtaining of a rise in social status but the opportunity to, meet at a text level with their peers, to interact with the text of other artefacts and through that interaction, inspire new artefacts. In metaphysical terms the artefact equivalent of procreation.
Case Study 3
‘Umlaut’
Figure 25. Explanatory notes for Case Study 3 ‘Umlaut’ cover page

1. Blue background is generated by taking a still from the text, which is constantly changing on the glass surface of Umlaut. Generated by creating a tubular structure in C4D, placing text on the inside wall of this surface and then filming the passing of the text as one passes through the inside of the structure.

2. Early projection experiments.

3. A top view of Umlaut taken slightly off centre including stand.

4. Three images that show the changing nature of the light source.

5. Early experimentation, an example of a model testing the incorporating the light source into the base.

6. Early experimentation, an example of a model testing the creation of the elliptical shadow.

7. Side view of Umlaut.

8. Early experimentation with a three-legged base configuration.

9. Ceiling eclipse, the effect of the light extends to the creating of an eclipse effect on the ceiling directly above wherever Umlaut is positioned.
Case Study 3 ‘Umlaut’

Text and Artefact in Unison

INTRODUCTION
The following text reports on the third design in the \( \text{DE}^9 \) experiment. A research study conducted within the context of the two previous practice led explorations of the relationship between text and artefact, theory and practice. Case Study No. 1 ‘Umm’ and Case Study No. 2 ‘Ury’ have already been presented. Case Study No. 3 ‘Umlaut’ presents the text articulated component of a sustained investigation into the \( \text{DE}^9 \) experiment and has resulted in an artefact where text has been incorporated into the fabric of its design. Where text is neither a post-descriptive analysis (Artefact before Text) nor a prescriptive (Text before Artefact) process but within the limits of a linear world text has been embedded, becoming an integral part of the designed artefact (Text and Artefact in Unison).

The undertaking of research, as presented in this document, brings to the fore, questions about the relationship between text and artefact and by implication the very nature and limits of knowledge. Theory and science occupy pedestalled positions within the dominant text-centric worldview, and by experimenting with text as artefact instead of text about artefact. A tentative bridge between the two, text and artefact, can be experienced and analysed in the pursuit of knowledge creation. To do this is to venture into the battle between ‘knowings’, between the knowledge that exists in the dominant form of text and other forms of knowledge. Heidegger’s (1967, pp. 4, 137, 248) concept of ‘thingness’ would be an example. It is to embrace, but not be blinkered by, the systemization of knowing into a hierarchy, which attributes value and honours observation, study and experimentation.

The epistemic interest of this research is the relationship between text and artefact. It contributes to the ongoing debate on the relationship between theory and practice and posits that knowledge is generated in reflecting and making, not just reflecting.

The text articulated component of the third study reports on a designed artefact, which has been named Umlaut. The design is a physical example of the effort to incorporate text into

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Umlaut: The commonly understood meaning of this word is the symbol written over vowels in German words and some other languages to indicate how it should be pronounced. In English an umlaut is caused by the bringing together of two vowels to create a new sound. ‘Umlaut’ the design brings text and artefact together.
the fabric of a light design. The text used is neither prescriptive nor simply a post descriptive analysis but has been embedded, becoming an integral part of the designed artefact.

THE SET OUT OF THIS SECTION

The introduction is followed by a preamble, which sets the context for the presenting of the third design. A section titled “… and the text was with design.” is then presented. This is a relatively short piece of text that was written (in the moment) at the conceptualisation stage of the third light ‘Umlaut’. This is followed by two sections called ‘Post Script’ and ‘Reflection on Process’, which expand on the “… and the text was with design.” section and on the making/design process respectively. This leads to the final chapter, Chapter 5 where a discussion and a conclusion to the DE study is presented.

PREAMBLE

To create a triptych you need three designs. There is opportunity for comparison and juxtaposition in a pair, but three creates stability. In research terms, the concept of triangulation (Cohen & Manion, 2000, p. 254) provides the assurance of multiple perspectives, rigour and accuracy. It is the corner stone of verification. The individual approaches can be assessed against each other, revealing advantages and disadvantages in relation to each other and providing a perspective greater that any single approach in isolation.

The first two light designs of the DE study have been physically realised as artefacts. They and their accompanying textural responses have already been presented both here and in public forums. (Dickinson, 2003a, 2003b, 2007, 2008, 2009) It is in reference to the two previous designs that the question of a third design was contemplated. It is not just a question of producing a design but the introduction of a new perspective, a variation in procedure, in relation to ‘text’ that would enhance the study as a whole.

How can we achieve this desired third position? The first two experiments were quite neat opposites. The requirements for a third experiment was predicated on the concept of triangulation from research theory principles but initial attempts to construct the parameters of the third investigation simply added complexity. Rather than adding a layer of complexity, let us consider the idea of producing a design without a written response or a written precursor. While this, in itself, is not an exceptional approach within the design field, with many designers producing designs without penning a single word, in the context of the earlier methods of enquiry this is a simplification, which becomes more complex because it is being undertaken within the paradigm of research. Where text is de rigueur. If the text is not to be before or after, it would have to be in, part of, or at one with the design. Without a
firm idea that such an approach was possible or just a metaphysical conjecture. The third design was contemplated.

Most designs live in an extraordinarily text-less land of unannounced solitude, making their own way into our lives and out again without a printed word to their name. Even those designs which have accompanying texts, even those that could be termed design icons, which have atypical volumes of text-based documentation live the bulk of their lives physically separated from the text.

Used or abused, the important and not so important designs that constitute the fabric of a real world are created every day. These designs surround us, and are key to our daily functioning, and yet, they are frequently left to be interpreted, without textual support or explanation, a contradiction to our apparent predisposition to the authority of the written word. While we use the eyes to read text, much of what engages the eye when not reading is the product of anonymously produced design without text-based supporting documentation.

Here was the question to form the essence of the third design. Can text be part of the design beyond that of a physically separated role?

It is with these thoughts and within the context of the earlier designs that the design of the third light is engaged. An experiment was undertaken where the idea of producing a design without a written response or a written precursor is postulated in the classic sense of an experiment. A “Procedure adopted on chance of its succeeding”. (Oxford, 1987, p. 363)

The next section was written during the design conceptualisation. The quotes were not remembered verbatim at the time of writing but were recalled with reasonable accuracy, and were corrected later.
“...AND THE TEXT WAS WITH DESIGN.”

“In the beginning was the Word, and the Word was with God, and the Word was God.” (Gideons, 1978, John 1:1)

“The fact is there is only one world, not two worlds, one meaningless and the other full of meaning, or one good and the other bad. People only think there are two worlds, due to their discriminating faculty. If they could rid themselves of these discriminations and keep their minds pure with the light of wisdom, then they would see only one world in which everything is meaningful.” (Kyokai, 2001, p. 415)

To begin with a sincere apology to anyone who is offended by the arguably out-of-context use of excerpts from two Holy Scriptures, the quotes illustrate the exalted position of the word. The basic building blocks of a text-centric world. From the beginning words have played a critical role in understanding, enlightenment and concepts of authority. If text is favoured, is pedestaled in the revealing, making accessible and the transference of ideas of the world. If this is true of the world we inhabit in a real sense and create in the metaphysical. Then it is we who create a worldview with a division that is a construction of our own making. “...everything is meaningful.” (Kyokai, 2001, p. 415)

The third design, therefore, accepts the existence of texts and words as entities in and of themselves. “In the beginning was the Word”. The third design will harness text as being core to the materiality of the artefact, rather than being a post-descriptive addition or a pre-design prescriptive entity. Text becomes an integral part of the designed artefact while still adhering to the original constraining parameters of the study that the design be for a ‘light’. 
The text on the preceding page was written at the defining moment of the third design’s conceptualisation. At the critical juncture when the ‘question asked’ propels the design forward, exponentially. It was a point where the concept of embedding text within the design and utilising the point of illumination manifested itself in my thinking.

Figure 26 Umlaut illuminated and illuminating her text

*Presents images of Umlaut taken from above. The text of this design is in the design both by intent and physically. Not a separate entity but part of the designed artefact. The text is visible when Umlaut functions as a light because the text is emitted from the light source. The text is not separate from the artefact but part of Umlaut.*

Figure 27 Umlaut as a light

*Umlaut stands 140 cm high with a footprint of 40 cm diameter. When Umlaut is switched off it has the presence of a relatively normal light fitting with possible pretensions to being a sculptural piece but turned on it presents its dynamic character and presents its embodied text.*
POST SCRIPT

This section of text, created at the conclusion of the experiment, returns to the more traditional position of post artefact production of text. Sless’ argues that all, (2003, p. 2) “Theories are in part post hoc rationalisations - the plausible stories which we tell ourselves to account retrospectively for our actions.” The experiment, the artefact realised in this third study, actively utilised text in the design mix at the time of conception. The design grew, and grew exponentially from the proleptical qualities of the question asked, “Can text be a material part of the design?” But it was more than that. To use a misquoting of an earlier quote here. “In the beginning was the text, and the text was with the design and the text was the design.” This sentiment set the agenda and guided the design process but in the end text was still only an element, a part, it (text) was not the entirety of the design.

To invoke reference to sacred texts and then misquote and deliberately play with the established methods of undertaking the task of design is to conduct an experiment. It may be simply an elaborate way of setting oneself up to fail. But it does allow text and artefact even theory and practice an opportunity to coexist rather than be exotic strangers. How successful the design produced following this method has been is really a matter for others to judge.

Considerable time, effort, false starts and dead ends were encountered in the development of the third experiment of this research. Much of that which is written about design will often focus on these ‘how’ details. It can make good stories and engaging reading. However the recording of the Eureka point, the moment of conception is poorly reported and illusive. The conceptual impetus for starting this third experiment was this unrelated, serendipitous statement, which came from the lips of a fellow designer, which brought me back to text’s direct relationship to the designed artefact.

“If you have to explain it (the design only makes sense with a companion text). It’s not working” Dunstan’s (2008) statement was an off-the-cuff remark, a response made as he was assessing a design we both happened to be looking at. Upon inquiry it was revealed he was quoting Austin Begg, who was famous or infamous for regularly making this statement. The statement is important as it is indicative of a professional tradition, part of the unspoken code, the taught but not explicitly articulated thinking that exists in a community of practice that designers inhabit. It is a reminder that it is the effective manipulation of the non-text based elements of a design that are the special talent of the designer. It does not preclude a

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Proleptical: Adjective form of prolepsis. Anticipatory; representation of a thing as existing before it does; a precursory concept or conception. Prolepsis was one of the three criteria of truth in Epicurean philosophy it dealt with preconceived notions of things, ideas and that which is yet to happen but will be. It describes the treating of a future event as if it has already happened.
designer from having wordsmith talents but it is their manipulation of that which is not
word-based that makes them (designers) special. So for the final design in this triptych the
incorporation of text into the design at a very fundamental level became the goal. It became
the Q that directed the design.

Despite the Don Quixote aspect of posing such a goal to not set such a challenge would
produce a third design that would continue the separation of two worlds, that of text and
artefact. Instead, the third design aims to capture the sentiment of the second of the two key
quotes “The fact is there is only one world, not two worlds, one meaningless and the other
full of meaning, or one good and the other bad. People only think there are two worlds, due
to their discriminating faculty.” (Kyokai, 2001) So with the text-based quotes in my mind
that presents ideas of unity, oneness and perception but also with the notion of text being a
material part of the design. The process of designing the third design Umlaut was
undertaken. The objective being to have text within the design not separated. This has been
achieved; the design has been exhibited at a double blind peer reviewed exhibition in
Helsinki. But at present I am engaged in a text based academic exercise, the production of
this document. So unless you have already seen Umlaut you only have this text and some
images as proof the artefact ever existed.

REFLECTION ON PROCESS

The preceding text has discussed thoughts relating to the conception of the third design,
which is typically associated with the moment the form of the artefact, or as I would argue
the Qs of the D, is germinated. Now while acknowledging the inherent problems of
conducting research that involves observing the researcher while maintaining a detached
observer position at the same time identified by Crotty (1998, pp. 33, 40, 205). The process
of self-examination and reflection in and for research also has its supporters Schön (1987)
and Sullivan (2004). Umlaut the third design will now be reconsidered in terms of a
reflection on process.

The moment of the third design’s conception actually had two parts or two conception
points. Both conception points were preceded and followed by much design thinking, and,
as evidenced by this document, considerable text production was also undertaken. The
earlier conception point relates to the problem setting. The question asked in presenting
DEQ because in the setting of the question (Can the text be in the design? concept) an
exponential influence on the design process was experienced. What followed was the second
concept point, the concept of using the light source as the generator of text that could be
argued as being in or of the design. The second conception point was really an answer to the
question posed at the first conception point. In answering the first question it instigated
many more Qs but it did result in a use of text that was not pre-design or post-design but an
integral part of the artefact. The design was developing through effort and energy expended
on it but powered by the type of question asked.

Rather than detail the technical deliberations of the design (Umlaut), this reflection outlines
the thinking engaged in the third design’s development. The preliminary explorations of the
application of text into the light design’s structure were playful. It became apparent that
there were a number of interesting opportunities for designs that would be appealing. The
results of this initial design effort were at times tricky and quirky, but essentially surface or
decorative in nature. Which is not to say that they could not have been developed into
reasonable designs but by focussing on the Q and judging the design as a response to the
Qs. The design progressed and I would argue progressed exponentially.

By remaining focused on how to keep text as a fundamental material part of the design. By
focusing on the question. The concept to use the source of illumination itself as the way
expressing text eventuated. The light became text through the use of projection, leaving the
opportunity to play with the possibilities of whether the text would be functional or reduced
to visual patterning. This design concept had the simplicity and elegance to warrant testing.
The aim of incorporating words into the design had been achieved at a very fundamental
level.

The post-concept stage of Umlaut’s development saw experimentation with different light
sources, mirrors, assessment of readability functionality and stylistic changes. Despite
numerous prototype and design changes, it was the quality of the questions asked that
directed the design to completion. The objective of the experiment was not to provide a
vehicle for presenting a description of design practice. Rather, it was to conduct an
experiment that explored the relationship between text and artefact through design practice
in a way that might reveal insights into the relationship between theory and practice.
Chapter 5. Conclusion

I started with \( \text{De}^{\text{0}} \), some relationships to investigate and the desire to engage in research through practice. This was the start of a journey. I set off with an objective but no map. I travelled to a land of contradictions and saw design’s ‘heart of darkness’. In making my return journey I have made three lights. Not to light my path but to explore the text/artefact, theory/practice dilemma at the core of the darkness. I do not provide a map for the next traveller only the texts you are reading now. My contribution to the exploration of research through practice, research for practice.

The success of the journey was never assured. There were times when the act of continuing the research, reading another text, starting another artefact were acts of faith in the idea that research could be artefact centric. My journey could have been easier but it would not have been the same and I would not change a thing. I am happy to come to the end. I am proud of where I have been and what I have seen, what I have made, read and written.

The chronicler of a journey creates a narrative out of the condensing of the real, the experienced. Therefore that which now appears concise and manicured, went through long periods of frustrating wandering, through entangled texts in the windswept forest of theorising. There were glimpses of a way forward at key points. Enough to maintain a forward momentum. The travelling has only opened up towards the end as the lessons learnt and the treasure found came together in the document I have presented here.

A set of artefacts has been produced. Umm, Ury and Umlaut, a triptych of practice led research experiments. The preceding chapters have set out the artefacts’ stories, and their interactions with the text-based exploration of their questions.

The artefacts were designed to function as lights, they are created to illuminate, to shed light, to allow people to see, to reveal. But what they reveal is more than their form, their function or the illumination of the immediate area. By the varying of the parameters through which they were individually conceived, viewed and recorded. They are objects for research.

This being the case what did I conclude? What are my reflections? Upon finishing the third and final light in the triptych of light designs, having realised the designs Umm, Ury and Umlaut as real artefacts, that live in the physical, that have ‘thingness’ in the Heidegger sense. Enjoying the ease, with which I can look, turn, lift and prod them. My ability to dwell in their physicality is an experience I can relish as I sit here writing. But as I write, a part of their existence, their essence, their logos is being drawn out. Part of what makes these artefacts
artefacts is passing from thingness to textness. One can argue it is simply a process of being recorded, but they (the artefacts) are also being transformed into an information resource (predominantly text based) for the purpose of knowledge creation. The text being created right now is part of this process. The physicality of the artefacts recedes behind a growing wall of words.

The research set out to explore the relationship between text and artefact, theory and practice but the central question at this stage is. How important was it to have the artefacts? Why bother? I could have joined the theorists in their texts and left artefacts to the practitioners. The literature review revealed the heart of darkness. The mismatch between theory and its application in practice. In the halls of design practice where there remains a notable distain for engaging in text based ‘academic’ theoretical debate. Where some practitioners push this idea even further arguing, the academic exploration of a design, can be the equivalent of clubbing design to death with words.

Despite this divisive positioning of text and theory was started. The results of the experimentations are artefacts, individual objects, that are part of a set, a triptych of designs. The encounter with the designed object, the thoughts, the questions, the interactions between a human, theorising about artefacts and a set of specific artefacts has been set down in text. But there would not have been any text without the artefacts. The full thingness of the artefacts can dissipate in the translation to written text, vanishing between the lines or disappearing at the other end of a half finished sentence but their presence and role does not diminish.

The research undertaken in the study has engaged a practice led approach where artefacts, their design, their production and their contemplation have been central to the research undertaking from the positioning of a logo (an artefact) at the start of this research endeavour. To the climb out the ‘heart of darkness.’ To see the disconnect, to see it as real but undesirable. To venture forth into the darkness, to put on the gorilla suit, to eat the grubs. To visualise the uncross-able divide between text and artefact, the divide between those that theorise and those that practice, as a challenge, rather than a truth. This set the agenda for.

To stand in this gap was not just an intellectual exercise. It was physical; there were real things, artefacts, a triptych of designs. There was a strong sense of exploration and discovery but also danger. There was a sense of being where one should not be. Of having ventured into a no mans land between adversaries. That area that Jonas (2000) describes as the swampy ground between fields where design often finds itself. It was to experience being
viewed as a Quisling, a turncoat, indeed a fully actionable member of the infamous fifth column.

It is to question which side you are aligned to. To question the validity of the divide.

Having emerged from the heart of darkness revealed in the review of the literature. Practice, design practice was re-engaged albeit within a structure, a research design, that while addressing the conventions and procedures of an academic undertaking, anchors the research within artefact production.

This resulted in the design of three lights but more specifically in an intertwining of text and artefact. An intertwining of theory and practice. The pivotal point of differentiation between the three designs, being the text/artefact relationship.

The experimental parameters identified as the study developed were:

- Artefact before text
- Text before artefact
- Text and artefact in unison

The undertaking of the study revealed some of the relationship gap is inherent. Inherent in the physical silence of artefacts compared to the relative noise of text. In text’s headlong ambition to be noted, to communicate, even demand attention. Text cannot help pedestaling itself in a way that most artefacts only dream of achieving.

The study also revealed that by the time Umlaut, the third experiment, was being undertaken, the relationship between text and artefact, between theory and practice was changing; specifically it was changing within me. I was becoming comfortable; the gorilla suit was starting to fit. The act of continually and consistently working with both artefacts and text breeds not only familiarity it breeds fondness. The practice of using theory, the practice of producing text in the process of artefact production becomes normalised even desirable.

Both text and artefact are products of human authoring “…it is we who create a world view with a division…” (Kyokai, 2001, p. 415) Theory and practice have a relationship where theory is pedestalled in relation to practice. This is particularly so within the context of higher education. This pedestaling is well established with a long tradition but practice has an equally long tradition of being wary if not disparaging of theory. The design practitioner has
followed the example of the artist who traditionally defers the theorising of their work to others.

The \textbf{DE} study is not the only attempt to bridge the theory/practice divide. The present situation consists of increasing and converging efforts to theorize practice particularly and significantly with an increased ‘insider’ practitioner perspective. Despite the increase in activity there is still a tendency to produce research with a ‘knowledge of’ focus rather than a ‘knowledge for’.

Unfortunately if research is not produced which practitioners can identify with and that they find useful for the undertaking of their practice endeavours, the bulk of research texts will live a quite separate life disengaged from practice.

A theory aware practice where text is neither pedestalled nor subservient but integral to the production of artefacts will encourage knowledge building within design practice.

For me the process of undertaking this research has been an exercise in finding a legitimate, and authentic relationship between text and artefact, between theory and practice. This I have achieved. I have come out the other side having chugged the metaphorical grubs of text based theory and can honestly say they are no longer bitter. I can say that I now not only enjoy them, I can savour them. This journey may have ended but I plan future expeditions which will pursue ‘bridge building’ research which, delivers combinations of texts and artefacts that theorise practice in a way that invites practitioners to engage and partake in the theorising of design practice.

This document is written in support of a future where text is integral to the design of artefacts. Where theory and practice have a relationship where the importance of asking questions is central and that the questions asked through combining text and artefact, theory and practice produces results that are exponentially better designs.

The texts, the theorising presented in this document are for the three designs in the triptych. The texts and theorising produced are integral to and indeed were not possible without the realising of the artefacts, realised through practice.

The designs ‘Umm’, ‘Ury’ and ‘Umlaut’ constitute the triptych of designs undertaken for the \textbf{DE} research study. They embody the research, the thoughts, and exist because of the unique opportunity afforded by engaging in practice led research. By taking the time to explore the power of asking questions. At present, as I compose this text, the text and artefacts are all happily together, in one place but soon they will part.
They will all have adventures but the text will be set off first. Duplicated and dispatched text can travel with relative ease to anywhere in the world. Maybe this is the real advantage of text but it is an advantage not the reason for a divide.
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Appendix DVD Instructions

The appendices documents referred to in this document are located in an accompanying DVD. They can be accessed either via a computer, which has a video-viewing program, or via a standard DVD player connected to a television.

Viewing instructions and a synopsis of each of the appendices is presented in the following pages.

There are no camera craft or editing awards to be found here. The footage used has come from multiple sources, and is of varied quality. There was a wide range of formatting issues that had to be dealt with in assembling the footage that has been used. Despite this it is felt the pieces presented add to the reading of specific areas or the document as a whole. None of the appendices present exhaustive detailed explanation of technical issues. Rather they present a predominantly visual addition. To complement the text presented in this thesis.
Viewing instructions

Once the DVD has been inserted movement through the contents is achieved via moving the yellow bar located near the centre of your screen up or down, to line up with the desired Appendix in the list located in the right side of the screen. Clicking the selected appendix cause the video to start playing. This is if you are using a computer.

Viewing via DVD player linked to a television requires a control panel interface either on screen or via a remote control where up, down arrows and enter will provide access to appendix selection, menu and stop/start functions.
Appendix A1 Logo Hand Drawing

The video footage in this appendix presents short excerpts from some early experimentation. At the time I was exploring the idea of having a logo for the research. I was thinking and I was also experimenting with how to make a record of thinking that was not text based. Appendix 1A is of historical interest, reminding the reader of the activity that takes place, the activity that leads, that initiates but that disappears if not recorded.

In the document when $D = E^Q$ appears, the logo is fully formed, it is in its final text centric friendly form. The thoughts, the actions and the marking of paper presented in Appendix A1 has gone. The fact earlier versions of some chapters were written using an earlier form of the logo discussed in Appendix A2 is no longer evident now that the new logo has taken over.

At this early stage the notion of ‘to the power of Q (Questions) was being questioned with alternative options being thought through both mentally and physically.

Total Playing Time 1 minute 34 seconds
Appendix A2 Logo Development

This video presents details about how and why the logo changed. It presents the first version, which was used extensively at the start of the study and was effective in being the logo and representing the study until I started using the logo repeatedly in longer more complex text-based documents. The smaller scale of printed text was the main issue. The blurred edges caused printing and legibility problems, which detracted rather than enhancing the reading of the text. Therefore the logo was developed into the form used in this document by creating a vectorized drawing (a drawing that could be understood by the computer through geometrical formulas instead of dots) that could be inserted into a font and replace a symbol on the keyboard (I used the ‘Tilda’ key). This allowed the logo to be delivered at a stroke of a key and engage with the text within its own paradigm rather than be dealt with as an image with a different file structure. The difference may be subtle but it made a significant difference to the putting together of documents once the change had been made.

Duration 1 minute 28 seconds.
Appendix B1 Umm Images of the Artefact

This compilation of images is presented to give the reader a visual impression of the artefact. The first part of Appendix B1 is an extract of the video made to present Umm at the Art of Research Exhibition in Helsinki. When I finished the third light Umlaut in time for the exhibition. I wanted to send all three lights but the expense and the risks of shipping fragile glass object half way around the world made me reconsider. (It should be noted Umlaut made it to Finland in one piece but was broken being transported back, so the risks were real) In lieu of sending all the artefacts, video footage was taken and prepared so that at both the exhibition and during my presentations a visual impression of Umm could be delivered.
To the initial footage taken for Finland I have added some other images which either relate to the Eventyr presented in Case Study 1 or provide background details about the design of the bulb mounting mechanism which not only positioned the light source in the appropriate point. The process of clipping the light source into position provided soft urethane feet for the Umm’s glass bottom to rest on.

Total playing time of video clip: 1 minute 37 seconds
Appendix B2 Umm Glass Blowing

When you open this appendix you will see edited video excerpts from a taping of an Umm being created out of glass. The blowing of the glass took over an hour but the footage has been reduced to 5 minutes and 42 seconds. The major aspects of the techniques developed to achieve the Umm shape have been captured particularly the recording of the end-to-end pipe transfer to finish the Umm’s top. The Umm in this particular recording collapsed, because the glass shifted blocking the blowpipe opening located inside the still molten Umm. This caused the creation of a vacuum and the subsequent collapse of the shape. It happened to be the only Umm production I taped because in trying to do the video taping myself I found it difficult, dangerous and generally a nuisance to the actual activity of production. I did not make another tape, which in itself reflects the artefact focus of the first case study, which contrasts with a greater awareness of the need to record events in the second case study where the text came first.

That said the collapse itself does show one of the difficulties that could be encountered in the delivery of a new Umm. The film captures some of the feelings expressed in Umm’s Eventyr. Particularly where it says “In the stifling heat, the artisans performed a dance, an industrial ballet, poised and positioned in a precisely orchestrated performance between the fires of danger and desire, catching and throwing, teasing and manipulating the slow formation of the subject of their energy, their thoughts and desires.” (From the Eventyr, Chapter 4, p. 82)
The editing does make the production appear faster and less strenuous than either that expressed in the *Eventyr* in Chapter 4 or the real time experience of actually being there.
It should also be noted that each Umm needed a further 8-12 hours of annealing followed by a day of cold working before starting the installation of the electrical components.
Appendix C1 Ury Images of the Artefact

In presenting this compilation of images of Ury. It has followed a similar format to that used in Appendix B1 Umm presentation. It starts with an extract of the video made for presenting Ury at the Art of Research Exhibition in Helsinki. As stated earlier the video was originally made as a cost and risk management measure. But the video footage has been invaluable in allowing people who have not seen the lights in an exhibition a chance to obtain an impression of the artefact or at least a visual representation of them.

Total playing time 1 minute 57 seconds
After the first section of footage I digress into a commentary on the difference between Case Study 1 and 2. I state there were fewer drawings made and less need for them. That despite the Qs being well-defined, Ury still needed detailed issue resolution in the prototyping stage.

The biggest difference was the ease and success of publication. The paper could be sent off for review, while the artefact was still emerging. It did not stop that sudden last minute frenetic deadline squeeze when I was accepted to present in Milan but this time it was to finish the artefact. Notably it was the production of an image to insert into the paper, which caused the biggest deadline crunch. But this was such a change and a pleasant one to experience. The more typical last minute crunch for me has always been to create the text for an existing artefact.
Appendix C2 Ury Glass Blowing

The 5 minutes and 29 seconds of video footage shown in Appendix C2 is of a better quality than the footage taken during the making of Umm. It was a better camera but I think the real improvement came from Erin Lee taking over the camera work, which left me, to concentrate on the making of the artefact and for this I am very grateful. Especially now I have better footage than before.

We had been working all morning without success. The footage starts at a point where Ben and I are assessing how to make the shape. The first attempt is lying shattered on the floor and is being swept to the doorway as we speak. This, the second attempt did produce the first Ury.
The process has again been edited down, so only the key points in the process are being shown. The process developed in this successful glass blowing was used to make subsequent Urys.

In reflecting as I am putting down these notes. I can see that because the text was set I was far more demanding on the glass or more specifically I was asking glass to go where it had no inclination to go. Then capture it in that position before it decided to slump back to a more comfortable position. The text defined the design and the material had to come to the party, as there was no changing of the text under the parameters of the experiment.
The Umm had had its production problems but the process of drawing, building prototypes and focusing on the materiality of the artefact. Produced a design which was still technically difficult and at the limits of what the artisan and the furnace could achieve.

But the forcing of the material was far more evident in the making of Ury. Whether this is a result of the text based approach delivering a more prescribed design outcome can be debated but the production of the Ury was more difficult.
Appendix D1 Umlaut Images of the Artefact

A compilation of images presented to give the reader a visual impression of the artefact. Total playing time 1 minute 55 seconds.

I didn’t make a presentation video for Umlaut, she made her own impression by being there, in the flesh so to speak. She is not easy to photograph, especially when the text is being an active participant in the artefact being an Umlaut. The footage presented shows photographs taken with her light on and others with her light switched off. There is some full length panning shots. After these there are photographs taken at different points in her development. There are images of early prototypes made with pointy aluminium legs and mountain ash stays. There are even some shots of books being contemplated as the housing of the light source. I had been contemplating the notion of where is text normally found but I moved on and ended up designing a job specific ABS housing to control the light supported in a clear glass cylinder. This did make the light source look like it was floating in the air.
Appendix D2 Umlaut 1st Test

The footage in Appendix D2 is a tribute to the wonders of modern mobile phones. It is a recording taken on the occasion of the first test run of the assembled Umlaut. Despite its low resolution, the unimpressive staging and the use of almost random image as stand-ins for the, at that stage, unresolved text content. It (the footage) was added to my review submission for the Art of Research Exhibition though I did add a note to explain the text was still to be resolved. This raw footage was sent and it was successful in moving me to the next reviewing stage by which time the lighting / text issue shad been resolved.
Appendix D3 Umlaut Paper Experiment

Appendix D3 presents the most interesting example of a concerted effort to use the text from the actual paper I had written for Helsinki as materially part of the light. Though I didn’t end up using it the cyber tunnel created was. In creating the walls to place the paper’s text on, working out the movement requirements, the positioning and the process for recording the passing of a virtual camera through a virtual tunnel. The groundwork was laid for the final submission.

Total viewing time 1 minute

The video clip does present the entire paper running sheet after sheet, top to tail the full length of the tunnel. Even if we can’t read it the entire text of the document was part of Umlaut at least for a while.
Appendix D4 Umlaut Text as Material

Total viewing time 1 minute 20 seconds

There are two parts to appendix D4. The first part looks at text as an intriguing or decorative element while the second part looks at text as message. In both cases text is still a material part of the design and of the light.

Despite the results shown in Appendix D3 being quite interesting and attention grabbing, I formed the opinion, after watch and contemplating Umlaut in action. That it was more frustrating than pleasing because it had the promise of readability but could not deliver it.

Therefore in preparing the text to be used in the exhibition, the use of text was split. As an intriguing element text was used to coat the walls and was distorted by the location of the camera placement to create a moving vortex which did have the affect of drawing people in. Bringing them into the aura of Umlaut’s interactions with the world.
The second use of text presented in the following images saw me select short quotes from the paper. Then entering them into the projection program at a size and for a length of time that allowed for the quote to be read.

The text wanted to be read and the audience wanted to read. We have a very established relationship with text. We are intrigued when we see it doing something novel but we as a general rule prefer to have it behave in standard ways. I would have liked to have conducted more experimentation here and push this idea further but this is as far as I could take it before the exhibition. It would be an intriguing area to pursue with further research.
Appendix E1 Helsinki Exhibition

Total playing time 1 minute 48 seconds

When it came to assembling this Appendix item, I found my wobbly wandering footage quite poor and irritating. It was my fault a little bit of planning and a more focused engagement in the production of interesting video content would have helped. As it was I was far more interested in being there, in the moment so to speak. Speaking to people and interacting with the other exhibits, this appeared far more important than running around with a camera.

So when I did finally decide how to edit the footage I started by setting the scene, shifted to delivering a short excerpt from the exhibition and then move to a reflection based on two photos I took at the airport just before I left Finland. This might sound a bit odd but I am happy with how the compilation worked out.
The two photographs, which feature at the end of Appendix E1 were not taken with the intent of being used. I only became aware of them when I was going through all the footage I took in Finland and only then did it strike me what had happened.

One photo was taken when I arrived at the airport to head home; I was one of the first to arrive for my early flight. The other photograph was taken a little while later.

It was snowing and as I arrived I took a photo of my footprints in the virgin snow. When I had checked in, I wandered back out to check out the tracks my feet had made in the snow again. But they were now gone, trampled under a muddy mess off tracks left by others who had passed through the same entry point as I had. It was only then I noticed the artefact that had been standing over my head. Only then did I ignore the tracks and engage in the splendours of this text less encounter with an artefact. I did enjoy the moment I even took a picture as you can see.
Appendix F1 Group Photo ‘The Triptych’

In this appendix there is a simple photograph of the triptych, the three lights set close enough to be in the one shot. Lit so the three can be seen without competing with each other. By this stage there has been a lot of images shown of each piece. It just seemed the appropriate thing to have an image rather than text as the last thing to be seen wether you are coming to the end of this document or to the end of the DVD.

Group Photo ‘The $\exists^3$ Triptych’ Duration 18 seconds