A Practice-led Study of Design Principles for Screen Typography —

with reference to the teachings of Emil Ruder

Hilary Kenna

School of Graphic Design
London College of Communication

December 2012

Acknowledgements

With thanks to my PhD supervisory team at the University of Arts, Professor Teal Triggs, Stuart Evans and Dr. Angus Carlyle who kept encouraging and supporting my efforts despite a few significant intermediate pauses. Their advice and help has been invaluable. My thanks also goes to all those who participated in the interviews that helped to validate the direction of this study; and to Max Whitby at Touch Press, who was so open to allowing me to test my research on the design of *The Waste Land App*. Other special thanks goes to IADT for providing some financial support and to my colleagues on the Vis Comm programme, in particular David Smith, for the stimulating debates about typography and for the generous use of his typographic library. I am hugely grateful.

Finally, I would like to thank my long suffering family, Mum, Dad, Geraldine, Aisling, Corina, Simon (and all their families) who have covered for me when I needed them, endured my grumbling and excuses for being too busy all the time to do what really matters. Especially to Sam, Aaron and Eve who were wondering when the pretty horrible document would ever be finished. Most especially, to David, who quite simply kept me upright, and quietly did everything humanly possible to help me to complete – I can't ever thank you enough.

Abstract

A Practice-led Study of Design Principles for Screen Typography —
with reference to the teachings of Emil Ruder

This research proposes that traditional typographic knowledge does not sufficiently address the design aspects specific to screen typography such as 3D space, motion, time, sound and interactivity, and that traditional design principles require adaptation and expansion for screen.

This practice-led study presents a broad critical review of the emergent field of screen typography spanning screen media technologies, traditional typographic knowledge and contemporary practice. Its findings contribute a definition of the field of practice including an overview of the history, origins and properties of screen typography, a classification of practice areas, and key practical principles used in related screen-native disciplines such as film-making, animation and human computer interaction design.

Due to the rapidly changing technological environment of the screen, obsolescence is a key concern for this research and highlights the need for sustainable typographic design methodologies not aligned to specific technology. In this context, and following a literature review of traditional design principles, the work of Emil Ruder (1914-1970), a Swiss modernist typographer was identified as distinguishable in the field and particularly relevant to screen typography because of his holistic design approach underpinned by conceptual principles and systematic practical methods. This thesis provides a detailed analysis of Ruder's methods set out in his book *Typographie: a manual for design* (1967) and uses the findings to develop an experimental practice methodology for screen typography.

The developed methodology sets out a matrix of the constituent parts of typographic design practice that include: typographic elements, typographic properties, and design principles, which can be combined to create practical exercises in screen typography. The practice matrix was evaluated through peer review, then tested and applied in practice to the design of a series of experimental practical samples and online repository *type4screen*, and to an iPad app of T.S. Eliot's 1922 poem, *The Waste Land*.

Table of Contents

Chapter 2: Screen Media and Technologies   **61**

Chapter 3: Typographic Knowledge   **105**

Chapter 5: Methodology   **253**

Chapter 6: Practice Methodology   **269**

Chapter 7: Application and Evaluation of Practice Methodology   293

Chapter 8: Conclusions and Future Work 323

Table of Tables

Table of Figures

Chapter 1: Introduction

1.1 Introduction

> *…training in experimental typography, which involves the workshop becoming a laboratory and testing station, is more necessary than ever before if typography is not to congeal round principles that have long been recognized.* (Emil Ruder, 1967: 5)

This PhD research is a practice-led study of design principles for screen typography. It is based on the perceived shortcomings that exist in traditional typographic knowledge and practice, to sufficiently address the practical design challenges presented by screen media. Specifically, when compared with traditional typography, there is a dearth of accepted formal design principles and practical methods to govern the design aspects specific to screen typography such as 3D space, motion, time, sound, and interactivity.

This research builds and extends upon traditional knowledge to contribute to the field of screen typography practice in fours ways by presenting:

- **a definition of the field of practice** – including a definition of 'screen' in relation to typographic practice, an overview of the history and origins of typography on screen, identification of the design properties of screen typography, and classification of types of practice in screen typography;

- **an experimental practice methodology** – incorporating traditional design principles (from Emil Ruder) adapted for screen, as well as new design principles that address screen aspects (3D space, motion, time, sound, and interactivity) of typography;

- **a set of practical exemplars** – that demonstrate how the methodology can be applied in practice; through the provision of an online repository *type4screen*, which may be used by others in the future; and through an example of an iPad e-book, *The Waste Land* (App), by T.S. Eliot.

- **academic writing on design issues relating to screen typography** – two peer reviewed articles have resulted from this research that focus specifically on aspects of design practice for screen typography. These publications, in conjunction with this PhD thesis make a significant contribution to the relatively small canon of academic peer-reviewed resources on the subject.

The overall contribution of this research can be described as practice-led because its main outcomes and findings lead to new knowledge that has operational significance for practice (Candy, 2006). However, some of the practice-based outcomes, namely the *type4screen* repository, and *The Waste Land iPad App*, where new knowledge is gained by means of practice or the outcomes of

practice (Candy, 2006), also make a significant contribution to the catalogue of practical exemplars of screen typography in new areas (iPad e-books) of this emerging field. The significance and role of practice in this research is further explained in section 1.6 of this chapter. As academic writing about design issues relating to screen typography is also emergent, this thesis provides a unique examination of the field from a practitioner's perspective.

1.2 Background to the Research – Problem and Perspective

The research question arose from my day-to-day experience and practice working as a designer and lecturer in design for digital media. I have over twenty years experience in the field, as a professional practitioner (20), educator (13), and latterly, researcher (8).

On a daily basis, working as a teacher and a practitioner, I have found there are many differences between print and screen typography on a macro and micro level and that traditional practical methods require revision and extension in order to address the non-traditional aspects of screen typography (such as motion, sound, and interactivity). Equally, traditional aspects of typography (such as typeface style, weight, measure, colour and composition) operate differently when applied to screen, and therefore require newly adapted approaches rather than the wholesale transference of traditional design knowledge to the context of the screen.

Ongoing critical reflection on these issues during my daily design and teaching practice, coupled with my traditional education, greatly influenced the motivation and point of view from which this research was developed. In the course of trying to resolve design problems for screen typography in practice, and through the development of curriculum and teaching materials for my students, I was practically exploring this territory for a considerable time before embarking on PhD research.

The need to further critically develop my explorations, and to consult the experience of other designers and educators working in the field, directed me to engage in formal research. I considered a practice-led PhD study would offer an academically rigorous context in which to further examine screen typography and provide an opportunity to engage with peer review.

Having arrived at the latter stages of this research (after eight years of part-time study), it is clear that this research question, motivated by the experience of personal professional practice, is a problem also faced by the wider community of designers and educators working in the realm of the screen.

From both a practice and teaching perspective, the lack of formal literature (see figure 1.2) and research on design principles for screen typography is evident. Equally, the canon of critically documented practical exemplars for screen is still small in comparison to the five hundred year tradition of print. The general focus of available material for screen is more concerned with current

techniques and technologies, rather than underlying design principles for practice, which is the subject of inquiry of this PhD.

The emergent nature and relative newness of the field (circa three decades old) suggests that designing typography for the screen continues in a state of flux, reacting to, and changing with every new technological development. For example, when this research began in 2004, the iPhone and iPad had not been invented. At the time of writing in 2012, smart phones, tablets (Gillet, 2012) and e-book readers are amongst the fastest growing screen platforms for text media publishing and consumption (Wisenbart, 2012). Additionally, one of the main practical exemplars that demonstrate the application of the practice methodology, developed during this PhD, is the design of an iPad e-book. The iPad screen is perhaps a representative embodiment of all the latest developments in screen technology. It is portable, with a very high-resolution (retina) display, is easy-to-use via its touch-based graphical user interface, it can present rich media content from anywhere in the world instantaneously and it enables its audience to socially interact and communicate with each other.

The research journey documented here represents an initial contribution to a relatively immature field that has few precursors. From the professional perspective of this researcher, it has opened up a host of additional research questions not possible to examine within the scope of this study, and as such provides a foundation for ongoing future research in the field.

1.3 Research Question, Aims & Objectives

Aims and Objectives

Over the course of this research study, which was completed on a part-time basis over an eight year period, the original research question remained principally the same, although the aims and objectives of the research changed direction. An explanation of this and how a narrower focus emerged is outlined in the discussion below.

The original aim of this PhD was:

- to critically examine and practically explore what are the emerging and changing design principles and methodologies for screen typography in contemporary practice.

This broad aim reflects:

- the newness (circa three decades) of the field and;

- the scarcely documented nature of the research territory.

As a result, the initial stages of this research necessitated a rather expansive critical review (documented in chapters 2, 3 and 4) of the research territory in three areas: technology, literature and practice, in order to:

- clearly define the field of research and;

- to narrow the focus of this inquiry.

The resultant research approach was initially organic – taking the form of a generative and iterative research methodology where the findings at each stage determined the next step in the research.

The findings from the critical review of the territory (documented in Chapter 2, 3, and 4) resulted in a working definition of the field. This in turn re-focused the aim and objectives of the PhD, to concentrate on conceptual practice methodologies for typography that were not technique-led or based on a specific technology.

This narrower scope reduced the overall size of the research to focus in particular on the work and methods of Swiss typographer Emil Ruder (1914-1970) (documented in Chapter 5) as a basis for devising an experimental practice methodology for screen typography (detailed Chapter 6) which is one of the key contributions of this research.

The newly derived research objectives produced from the original aim, formed the core basis upon which the research was conducted, as follows:

1. To **define the nature of the 'screen' environment**, its underlying properties and what it means in relation to typographic practice;

2. To **define the nature of screen typography** – its different manifestations, underlying properties, and the design principles that govern its practice;

3. To **develop an experimental practice methodology** for the practice-led exploration of screen typography that is conceptually, not technically led, and therefore applicable to any screen-based design context irrespective of the technology being used;

4. To **apply and evaluate the devised practice methodology** in practice by using it as the basis to make a series of practical explorations in screen typography.

This thesis presents a critical account of the research journey that set out to achieve the original aim, but which became a narrower study focused on the development of conceptually led design principles and methods for screen typography.

The following diagram (figure 1.1) represents the four stages of this research study and provides an overview of the structure and flow of research activity at each stage. The aim of the diagram is to provide the reader with an understandable synopsis of the research journey undertaken during this PhD.

Structure of PhD Research Study

Stage 1 Exploration + Definition

Typographic Literature

Screen Media & Technology

| Research Question & Territory |

Theory

Technology

Practice

| Definition & Scope of Territory |

Design Principles for Screen Typogarphy

Contemporary Practice in Screen Typography

Design Principles for Screen Typogarphy

Stage 1 Findings/Outcomes

Stage 2 Analysis + Development

| Analysis of Ruder's Methodology |

| Development of Methodology |

+

| Analysis of Stage 1 Findings |

| Experimental Practice Methodology |

Critical Focus on Emil Ruder's book
Typographie: Manual for Design

First Draft of **Practice Matrix** for Screen Typography

Stage 2 Findings/Outcomes

Stage 3 Application + Iteration

| type4screen practice experiments |

| Critical Reflection on Practice & Methodoloy |

| Application of Methodology |

+

| The Waste Land iPad App |

| Practice & Methodolgy Iterations |

Revised Drafts of **Practice Matrix**

Stage 3 Findings/Outcomes

Stage 4 Evaluation

| Interviews |

| Critical Review of Methodology |

+

| Presentation & Publication |

| Feeback & Iteration |

| Conclusions & Future Work |

Current Draft of **Practice Matrix**

Stage 4 Findings/Outcomes

Figure 1.1 Diagram showing the structure of the PhD study.

1.4 Introduction to Research Territory

This research centres on a problem that exists in the crossover between two main areas of interest – the design practice of typography and the screen environment. What follows is a brief overview of each area to aid the reader's understanding of the context in which this research is situated.

Typography

I am a leaden army that conquers the world. I AM TYPE! (Frederic W. Goudy, 1931)

Defining the field of typography has remained closely associated with the history and development of printing. In 1931, the famous type designer Frederic Goudy wrote a short manifesto *I AM TYPE* and published it in a broadside through the Village Press. The piece, which is written like a preacher's oratory, but infused with irony, tries to capture the expanse and impact of typography's role (design of letterforms) within the history of written communication and the printed word. Despite the hyperbole, Goudy manages to convey a definition of typography that shows its vast and varied applications, (from the 'first impress of my face brought the Divine Word to countless thousands' to 'I coin for you the enchanting tale, the philosopher's moralizing and the poet's visions') and the permanent authority of printed typography ('In books I present a portion of the eternal mind caught in its progress through the work, stamped in an instant and preserved for eternity').

Other contemporary efforts to define typography such as that by author and typographer Ellen Lupton, are much broader with regard to the physical method of production of typography but like Goudy, are equally suggestive of its universal application:

Typography is a tool for doing things with: shaping content giving language a physical body, enabling the flow of social messages (Lupton, 2004, p8).

Regardless of production methods, which change over time with advances in technology, typography is a practice-based discipline. It involves the design, organisation and layout of textual matter into meaningful aesthetic visual form for the primary function of communication. It is an integral part of graphic design practice, often described as the backbone or even the 'lingua franca' of the discipline (Heller, 2004). Design historian and author, Steven Heller, suggests that typography is 'the single most important graphic design element' and probably the 'most consequential' subject in the course of a graphic design education (Heller, 2004).

It is difficult to divorce typography from the practice of graphic design and there is much debate historically and contemporaneously as to the merits of this (Tywman, 1968, in Jury 2001). This interrelationship, acknowledged widely within the discipline, is plainly stated by designer and teacher Emil Ruder in the introduction to his seminal book *Typographie – A Manual of Design*:

Typography and design are virtually synonymous. (Ruder, 1967).

Designer and modernist critic, Dan Friedman also provides an appropriate summary of the nature of a designer's/typographer's practice:

> *As designers we evaluate and organize information to facilitate, control and encourage the process by which it is consumed. The typographer, for example, manipulates positions, sizes, weights, spacing etc. and, if lucky, even the writing. Through this process of structuring, emphasising and de-emphasising, the way and sequence in which our audience receives a message is significantly influenced.* (Friedman, 1978, in Jury, 2001)

Friedman observes that typography is a practice-based discipline encompassing an equal blend of critical, conceptual and craft-based technical skills. In the context of this research, the aspects are deemed vital to the designer's, and subsequently the typographic designer's, daily practice.

Until the late 1980's design and typography remained for the most part within the confines of the material quality of print excepting the sparse endeavours into film titles and early television graphics. Since the invention of printing (over 500 years previously), typographic design has primarily developed in parallel with the technological advancements of print and publishing production. The 500 year history and practice of print typography, including its main stylistic milestones and pioneering practitioners have been well documented since the beginning of the last century (Meggs, 1998), (Jubert, 2007), (Friedrich, Ott, Stein, 1998).

There is now a substantial growing body of formal literature available about the practice of print typography (figure 1.2 Literature Map). A review of this literature (documented in chapter 3) shows that the guiding principles and methodologies of typographic design for print are now well established and documented, having been thoroughly explored from a print perspective over the course of the last century by a wide range of design, practitioners, historians and educators (Ruder, 1967), (Lewis, 1968), (McLean, 1980), (Hochuli, 1987), (Craig, 1980), (Speikerman & Ginger, 1993), (Kunz, 1998), (Bringhurst, 2001), (Baines & Haslam, 2002), (Lupton, 2004), (Samara, 2006).

FOR PRACTICE
- Screen Design & Typography (15)
- Book Typography (9)
- Grid/Layout (13)
- Typography (56)
- Design Basics (21)

ABOUT PRACTICE
- Education & Critical Writing (27)
- History (11)
- By/About Designers (24)
- Anthologies of Practice (12)
- Legibility (22)

© Hilary Kenna, 2006–2012.
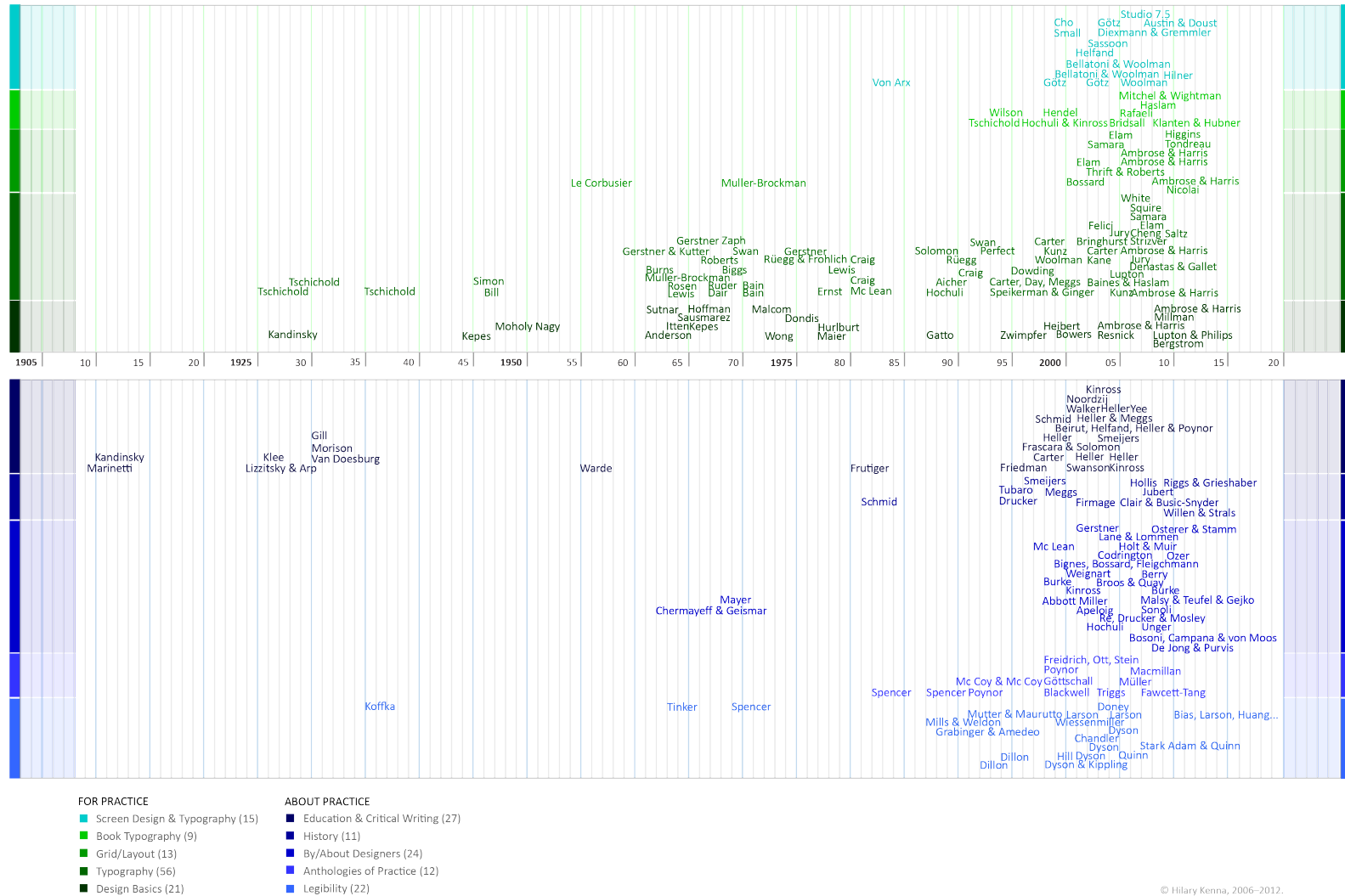
Figure 1.2 (previous page) Literature Map visualisation of critically selected literature.

Screens Media and Technologies

Screen media and technologies are a relatively new invention. Although, the moving image screen has been around for almost a century, the digital screen is circa three decades old. It is this screen, in its multifarious guises, that concerns this research, because it is fast becoming the competing and replacement substrate for typography (Wisenbart, 2012).

Since its inception, the computer has been improving in speed and performance two-fold every eighteen months. This phenomenon, now well known as Moore's Law (Keyes, 2006), has meant that the development of screen technologies and digital devices are continually changing at an unprecedented rate. It is hard to believe that smart phones such as the iPhone, released in June 2007 and touch tablets such the iPad, released in April, 2010 are not yet a decade old. According to Apple's quarterly sales figures published at the end of 2011, the iPhone had sold in excess of 100 million devices and the iPad in excess of 40 million.

Information and textual content on screens has been growing at an even faster rate. The speed of this growth remains unparalleled with any event in the history of media communication. For example, in 2008, just twelve years after it was founded, Google recorded it had indexed over 1 trillion web pages (Google, 2008), and as of June 2011 the estimated total number of Internet users was 30.2% of the world population equal to 2.095 billion people (MiniWatts, 2011). All of these users are accessing information via digital screens in some form or another.

Everyday, more and more people are generating and consuming text on screen. It is fast becoming our primary means for creating and communicating information. In this rapidly growing and changing technological context, understanding the nature of the screen environment, and how typography functions within it, presented a critical challenge for the sustainability of this research.

Screen Typography

Designing typography on screen has presented an uncomfortable relationship from the beginning. The fine details of letterform shapes are more naturally aligned to the refined, high resolution and portable technology that is paper. For most of its early decades on the digital screen (1980-1995), typography was a lesser representation of its printed counterpart because of:

- **Low screen resolution** – type was crudely rendered (72dpi) especially at small sizes typical for body text) which in turn resulted in poor legibility and aesthetic quality compared to print resolution (minimum 300dpi);

- **Little reading consumption** – reading text on screen was mainly associated with productivity software and there were almost no dedicated digital reading devices;

- **Poor standard of typography** – well designed content was sparsely evident because designers were slow to move into the field due to their cultural background in print, and the perceived technical barrier to entry – up to this point, designers primarily used screens as tools to make print design.

From the late 1990's onward, the environment for screen typography began a process of rapid growth and change as screen technologies vastly improved and became ever more prevalent. In particular, higher screen resolution, better type rendering technologies and the mainstream use of the Internet and mobile phone technology resulted in unprecedented explosion of online publishing. Masses of text and rich media information were now available on every screen, and screens were everywhere. Accordingly, the need for good on-screen design and typography increased rapidly as users struggled to find their way through the flood of textual information competing for their attention.

Today, the mainstream usage and prevalence of text on screen-based devices has ensured that the way we generate, design, publish and consume words has changed forever. In this context, the design of screen typography has a critical role to play in how people understand, are able to use and in what way they consume, text information on screen. It also suggests the need to broaden and adapt traditional definitions of typography, especially those closely aligned with print production, to encompass a much wider and varied range of physical/virtual screen manifestations. Returning to Goudy's definition, which references the physical limitations of 'leaden type', highlights the need for a new and broader definition for screen typography that encompasses the virtual pixel-based type that inhabit a multitude of screen devices. As this research will later demonstrate, Goudy's statement of certainty 'I AM TYPE' in relation to print typography, may be thrown into disarray as the broadening scope of what may now constitute typography (on screen) leads to the question 'Am I Type?'.

This research concentrates on the design principles and methods required to help designers meet these challenges by contributing a working definition of the emergent field, by the development of an experimental practice methodology for designing screen typography, and by providing practical examples that test the methodology and demonstrate the findings of the research in practice.

1.5. Scope and Limitation

Problem of Expansive Territory

The most difficult challenge in the early stages of this research was defining and narrowing the specific scope of enquiry because the territory is a composite of two broad technological fields: screen media technologies, and typographic design.

Two problems emerged from the outset:

- the **breadth** and **diversity** that each field encompasses: technological, theoretical, practical and social concerns and;

- the issue of **currency** due to constant technological change and development occurring in both areas.

These factors necessitated a research approach that would:

- use methodologies that could be easily updated to incorporate ongoing future developments;

- focus on the conceptual and critical aspects of design for the screen, rather than the specifics of a particular screen technology, technique or method.

Establishing a thorough understanding of the research context required a critical review of three key areas relevant to this research:

- screen media technologies

- typographic literature

- contemporary practice in screen typography

Each of the three areas is large and complex enough to warrant individual research study in its own right. Therefore, the assessment, which followed was not an all-encompassing examination of each area, but rather a pertinent overview of the relevant contribution from each area to this research.

Critical Direction

From a practical perspective, trying to establish what aspect of practice to focus on, and how to choose subject matter that was suitable to foreground the design issues concerning this research was another challenge in scoping the extent of the PhD study.

Since one of the main research objectives was the development of an experimental practice methodology, a key task was to find an appropriate starting point that would:

- address the gamut of **different types of practice** within screen typography (e.g. Web typography, motion typography, interactive typography);

- **remain relevant** to screen design issues independent of the screen technology or technique used;

- be **flexible, open and adaptable** to the different approaches and techniques of individual designers, regardless of the subject matter of their work.

This criterion significantly influenced the critical review of typographic literature to concentrate on locating theories and models of practice that were critically and conceptually led rather than technique-focused (see Chapter 3). This critical perspective directed the path of research that led to the focus on Emil Ruder as a foundation from which to build an experimental practice methodology for screen (see Chapter 5).

Practice Focus

With the path of development ascertained, the practice methodology began to evolve along the lines of Emil Ruder's design principles and systematic practice methods as documented in his book *Typographie – A Manual for Design* (1967) (see Chapter 6). Key to this development was how to create an appropriate sample of practical outcomes that demonstrated how the methodology could be used in practice (see Chapter 7).

A set of discrete examples based on sampling a small selection of the identified design properties and principles were chosen from the developed methodology to illustrate how it could be used. Selected properties and principles were applied to the constituent parts of typography (letter, word, sentence, paragraph) where each aspect could be explored through a small set of practical outcomes. Creating an example set would typify how the same process could be used for any selection of other parts. An online repository, in the form of a practice blog (www.type4screen.com/practice or see enclosed CD in Appendix II) (figure 1.3), to record and critically document these samples was designed as a method for curating the future development of the practice methodology. Selecting and creating a representative sample of practical outcomes in this way ensured that the practical-led exploration of the research remained manageable, relevant and focused on achieving the objectives of the PhD.
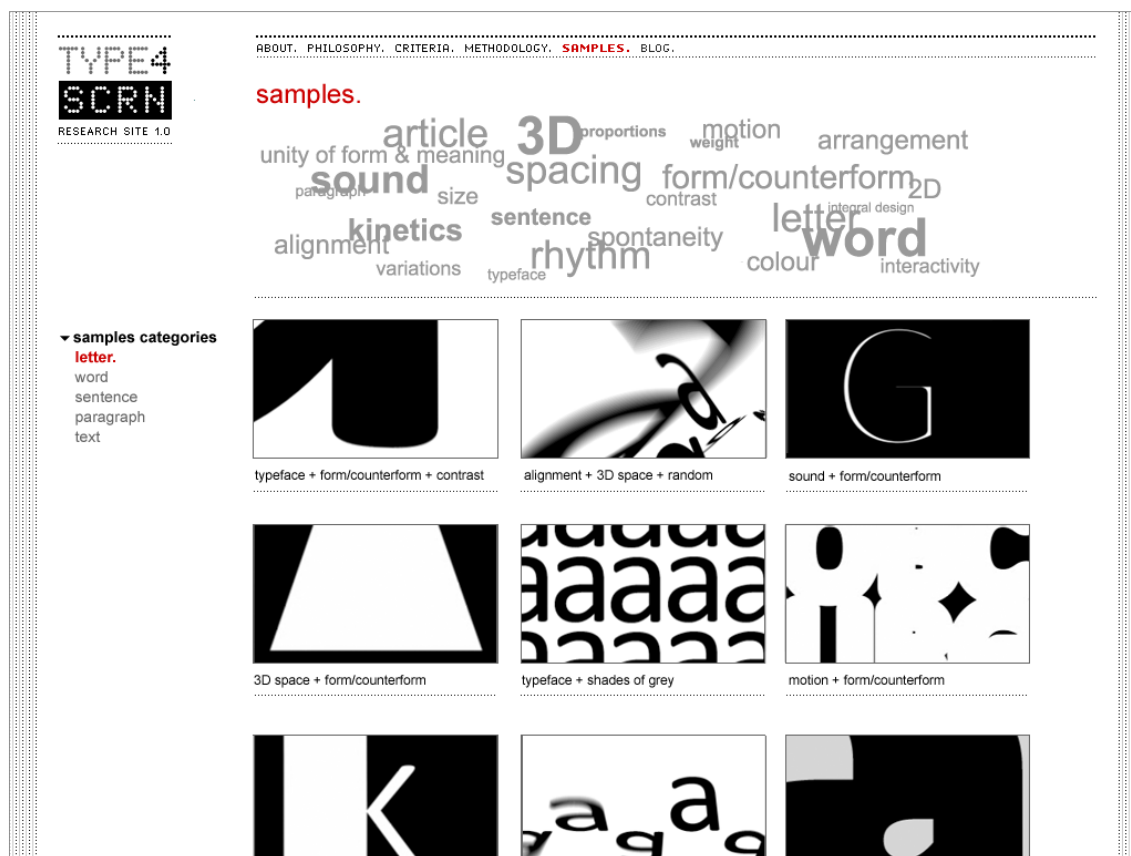
Figure 1.3 *type4screen.com/practice* website.

In order to demonstrate how the methodology could be applied to the design of a complete on-screen text, (not just constituent parts such as letter, word, line or paragraph) it was necessary to produce a full-text practical outcome. The commission to design a literary text, *The Waste Land Poem* by T.S. Eliot as an iPad e-book (figure 1.4), which occurred at this time, provided an appropriate opportunity to apply the practice methodology and main findings of this research to commercial design practice. Details of how the methodology was applied to the design of the iPad e-book are documented in the online repository and a full critical account of the design process is due for publication in December 2012, as an article *Touching the text of T.S. Eliot's The Waste Land: a critical discussion of interactive design and screen typography for an iPad e-book*, in the peer-reviewed journal *Book 2.0* published by Intellect Publishing (see Appendix III).

It was always the intention of this PhD to test and apply the developed practice methodology in the researcher's own practice to a full on-screen text, irrespective of whether the opportunity to design The Waste Land App with Touch Press had emerged. However, the suitability of The Waste Land iPad project as an exemplar of screen typography, and the receptiveness of the publishers to facilitate this research in conjunction with consultation with the PhD supervisory team deemed the project to be an appropriate practical application of the main research outcome which is the developed practice metholodogy.
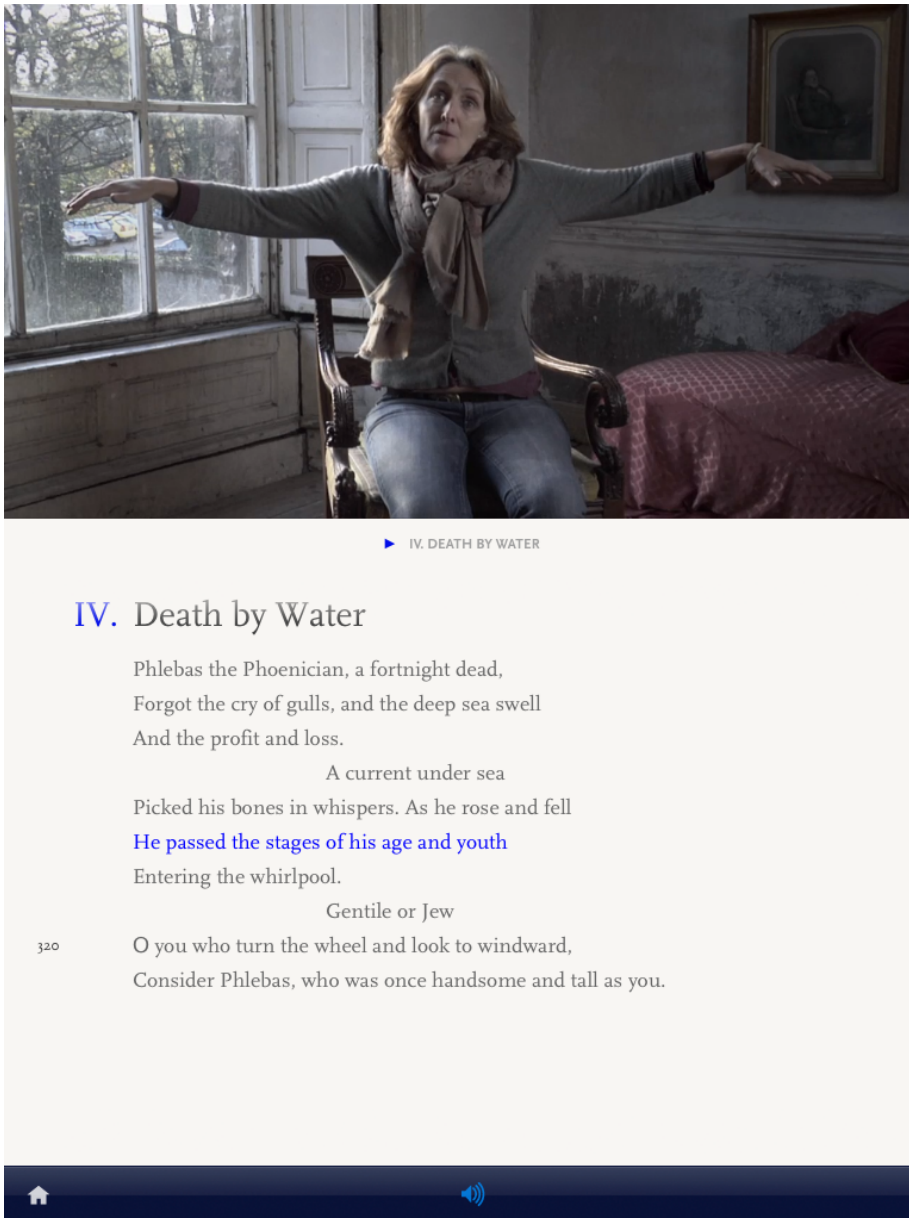
Figure 1.4 Screen shot from *The Waste Land iPad App* 2011.

The final scope and extent of this research may be viewed as initially expansive but narrowing quite specifically to focus on the development of a practice-based methodology for screen typography that is conceptually and critically-led (influenced by Emil Ruder's methods), rather than driven by technological concerns or techniques. This research aims to remain relevant to the practice of screen typography regardless of the continually changing technological environment within which it is situated.

1.6 The Role of Practice

Practice Related Research

> *...firstly, research which is initiated in practice, where questions, problems, challenges are identified and formed 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 in the visual arts.* (Gray, 1996)

Given the background expertise of the researcher – as both a designer and a teacher – the resultant PhD study is pre-dominantly **practice-led**. This means, that the main concerns of this research relate to the nature of practice, and the outcomes of the research led to new knowledge that has operational significance for practice (Candy, 2006). However, certain aspects of this research may rather be described as **practice-based**, whereby new knowledge is gained partly by means of practice and the outcomes of practice (Candy, 2006). It is therefore important to note the distinction between the two terms generally, and specifically in the context of how they apply to this research.

For any design practitioner engaging in research – where their practice, methods of practice, or specific aspects of practice, is the subject of their research – it can be very confusing to understand the literature and theories that classify and define the nature of practice-related research.

Having reviewed a number of approaches (Schön, 1984), (Frayling, 1993), (Gray, 1996), (Cross, 2001), (Candy, 2006), (Haseman, 2006), (Rust, Motram & Till, 2007), (Biggs & Büchler, 2008) – I concluded that my research was predominantly practice-led – that its main research contribution is about defining the field of practice and about devising new methodologies for practice in the field.

Practice-based research, on the other hand, contends that the artifact is the basis of the contribution to knowledge. In this research, whilst a number of practical artifacts were produced, it was the knowledge gained in the making of, and in reflecting on the making of, these artifacts that created the valuable contribution. The artifacts alone do not create the contribution of this research.

The AHRC's Review Report on Practice-led Research (2007) acknowledges that there are many different interpretations, as well as some contention, about the definition of, and differences between, the two terms in the broader context of art and design (Rust, Motram & Till, 2007). The report provides the following definition of practice-led research (PLR), which is broad enough to also encompass practice-based research (PBR) activities under its banner:

> *Research in which the professional and/or creative practices of art, design or architecture play an instrumental role in an inquiry.*

There is further confusion with terms such as 'theory-led practice' and 'practice-led theory' (Burgin, 2006), which are often used to describe research that is either practice-led, or practice-based, or that comprises aspect of both.

Other attempts have been made to provide criteria for the PLR and PBR paradigms. For example, Professor Michael Biggs and Professor Daniela Büchler (University of Hertfordshire) suggest eight criteria to determine the nature of PBR in the creative cultural industries. Their model proposes:

- four generic research criteria (Questions & Answers, Knowledge, Methods, Audience) and;

- four specific criteria (Role of Text & Image, Relationship of Form & Context, Function of Rhetoric, Function of Experience) to creative arts.

It is possible to argue that this research meets each of Bigg's and Büchler's eight criteria, and could therefore be described as PBR. For example, in relation to the first criteria, the **role of text and image**, the use of visuals in this research moves beyond illustration supporting the text. In this study, visualisation is integral tool of discovery that reveals and demonstrates, rather than describes concepts within the research.

Equally, other criteria such as the **relationship of form and content**, when applied to this research, show alternative forms to textual description in the form of visualisations and typologies (figures 1.2 & 2.2-2.6), which help to place the work in an historical and critical context.

Additionally, some of the research outcomes are artifacts (*type4screen* practice blog, *The Waste Land App* – see Chapter 7), but they are not presented as work that should 'speak for itself'. Instead, they are presented in the context of an accompanying **rhetoric** (critical text accessed via a graphical user interface), which enables the audience to read the artifacts within the context of this research, and also within the wider field of practice.

Although the initial motivation for this research came from a personal **experience** of practice, the research question was reframed to articulate a broader problem relevant to, and transferrable to, wider practice within the field. In summary, if Biggs' and Buchler's criteria are adopted here, it is clear that certain aspects of this research are in fact practice-based.

Before putting a final label on my research as either PLR or PBR, it is worth mentioning yet another seminal viewpoint in relation to research and practice.

Professor Christopher Fraying's paper from the Royal College of Art in 1993, sets out three main areas of practice-related research:

- **into practice**: research where practice (in general or by others) is the subject of research

- **about/for practice**: where the research aims are subservient to the practice aims

- **through practice**: where the practice serves as the research purpose

Considering Frayling's discussion of each area, his overriding concern, about the nature of practice-related research coming from art and design, appears to be that the:

- research must exist as subject or object outside the person doing the research (not subjective);

- researcher must be able to critically communicate what the research is about to others (not 'speak for itself').

In this research, while the main research question originated from the researcher's experience in practice, it was quickly validated as a universal problem experienced by other practitioners through the means of primary (interviews, chapters 4 and 7) and secondary research (literature, chapter 3 and practice review, chapter 4) in the field. Applying Frayling's approach to this research, it appears the role of practice does not neatly fit into one of the areas he describes.

This research is a study into the nature of practice, carried out through methods of practice that explore, analyse and apply the research in a practice context. The role and nature of practice is central to, and intricately woven into, the structure and methods of this research. In an effort to clarify the entwined nature of practice in the research, the following table (table 1.1) lists the main research aspects in relation to practice and attempts to categorise them under PLR and PBR.

(Practice) **Led**	**Practice**	(Practice) **Based**
Screen Typography (understanding the field of practice)	**Field/Discipline of Study**	Screen Typography (making work in the field of practice)
Theory Definition and Analysis of Practice Methodologies	**Question/Problem**	Application of Methodologies in Practice
• Concept and Visual Mapping • Information Design • Infographics • Data Visualisation • Visual Analysis • Interviews • Critical Writing	**Methods**	• Generative Iterative Design Process: • Sketching • Storyboards • Paper-prototypes • Photoshop mock-ups • HTML/CSS Prototypes • Critical Reflection on Practice (via online research blog and repository)
• Screen Typology, Usage & Properties • Literature Map • Practice Map • Ruder Schematics • Practice Matrix • Lexicon of Principles • Written thesis	**Outcomes/Findings**	• type4screen research blog • type4screen online repository • type4screen experimental samples • The Wasteland iPad App
Lecturer in Design & Digital Media (13 years) Principal Investigator on state funded Commercialisation Research Projects (4 years)	**Researcher's Expertise**	Designer in Professional Practice (20 years)

Table 1.1 Practice-led and practice-based aspect of the research.

In reality, the columns representing PLR and PBR overlap and are not mutually exclusive but mutually informative as the boundaries between them are often blurred.

However, returning to the original definition (Candy, 2006), it remains the view of this researcher to describe this research as a predominantly practice-led study.

Value of Practice

> *There are circumstances where the best or only way to shed light on a proposition, a principle, a material, a process or a function is to attempt to construct something, or to enact something, calculated to explore, embody or test it.* (Bruce Archer, 1995)

Further discussion about the nature of practice-based research is required because of its significant influence on the findings of this research in three ways through:

- the use of practice-based methods;

- the production of practice-based outcomes and;

- the practice-based critical perspective of the practitioner-researcher.

Nigel Cross's book, *Designerly Ways of Knowing* (2006), explains the context in which the origins of 'scientising design' emerged in the 1920's Constructivist Movement, and how design methodology became a focus for study in its own right in the 1960's Design Methods Movement in London. Cross defines design methodology as the study of principles, practices, and procedures of design that:

> *...includes how designers work and think, the establishment of appropriate structures for the design process..., the development and application of new design methods, techniques and procedures and reflection on the nature and extent of design knowledge and its application to design problems.*

What is evident from this definition is that design methodology is inextricably bound up with design practice. In other words, the design methodology is itself a practical endeavour (regardless of outcome) and therefore, there is knowledge within the practice itself that is worthy of study. This research is concerned with studying methodologies of practice in typography – what is the existing knowledge, how is it changing and adapting, what are the deficits – specifically in relation to screen-based contexts.

As far back as the 1950's, polymath Professor Michael Polanyi defined knowledge learnt through practice as **tacit knowledge**. He recognised that this form of knowledge was 'learnt by doing', but was often not verbalized, rather carried out unconsciously (or intuitively) based on skills learnt through repeated experience.

The same can be said of typographic knowledge which is traditionally learnt through practice in studio based environment, with a senior (experienced) practitioner teaching and mentoring a junior (less experienced) practitioner through an iterative form of making, critiquing and re-making work. This tacit modus operandi is true for both educational and commercial settings.

Value of Tacit Knowledge

> *(Reflective practice is a) dialogue of thinking and doing through which I become more skillful.* (Schön, 1983, p. 31)

The value of tacit knowledge gained wide acceptance through the seminal work of Donald Schön. In his book, *The Reflective Practitioner* (1983), Schön sets out the concept that experienced practitioners possess significant '**knowledge-in-action'**, which they often cannot consciously articulate, but which they can execute unconsciously. If we take designers as an example to apply this theory, it is true that many experienced designers intuitively work through an intricate design process in order to produce a solution to a design problem. They are often not explicitly aware of how exactly each step in the process leads to the next.

Schön ascertained that an experienced practitioner can draw upon their intuitive tacit knowledge and apply it to new situations or problems as they occur in practice – a process he describes as **'reflection-in-action'**. In a design context, this reflects a designer's ability to apply their skills to multifarious design problems and multifarious aspects within a single design problem. Designers do this as a matter of course in their daily professional practice without conscious articulation of the process. Schön describes 'reflection in action' as a progression from the rote following of rules to questioning, criticizing and reforming assumptions through a continuous process he calls a 'reflective conversation with the situation' (Schön, 1983).

The problem of extracting individual tacit knowledge and formalising it into a form that is transferrable to others remains a constant tension in training and education for practice-based disciplines. Schön proposed that a process of conscious 'reflection-on-action' which comprises reflecting on both 'knowledge-in-action' and 'reflection-in-action' could provide a means for accessing and making explicit the value of individual tacit knowledge in order to pass it on to others.

This research acknowledges that much existing typographic knowledge is tacit and that Schön's methods (such as the 'reflection ladder') for reflection-on-action in practice could provide a useful method for extracting, generating, revising and refining this tacit knowledge into a more generally applicable methodology or model of practice.

In the research, Schön's methods for the reflective practitioner were used and adapted in three areas for:

- interviewing practitioners about their own practical methods;

- reviewing and gathering feedback from practitioners on the practice methodology proposed by this research;

- critiquing practical exemplars made by the researcher during the course of this study.

Finally, it is important to note that this research was carried out from the perspective of a experienced practitioner, who is:

- **a professional designer** – with a working knowledge of, and on-going fluency in, the design process, set in the wider context of commercial commission and design consumption.

- **a design educator** – experience with theories and methods of instruction, demonstration, presentation, reflection, and evaluation within the formal context of an educational institution, adherence to curriculum, assessment guidelines and procedures.

This experience has significantly informed the basis from which this research was conducted and analysed.

The next section presents a more detailed discussion of practice-based methods used in this research, and their significance to the research findings.

1.7 Methods used

Value of Design Methods for Discovery

Nigel Cross and Donald Schön, amongst others (Simon ,1969), (Glynn, 1985), (Polanyi 1958), distinguish the value of 'design as a discipline' as unique to other fields because of its constructivist approach to solving 'messy problems' through invention (Cross, 2001).

According to Schön, design practitioners use implicit, intuitive artistic processes and apply them as an effective means to solve difficult, non-quantifiable problems. In other words, Schön believes that the application of design thinking and practical design methods to produce innovative solutions, could not be arrived at through other analytical, logical and scientific means.

Michael Polanyi also refers to this as a 'logical gap' that exists between knowledge and discovery or innovation, which cannot be crossed with factual knowledge, logical reasoning or iterative development of existing concepts. According to Polanyi, a kind of leap or 'illumination' is also required so new concepts can be proposed and developed to bridge the 'logical gap'.

Schön, Polanyi, Cross, and other theorists recognise that creative disciplines such as design may provide the necessary methodologies to leap the logical gap.

> *It is the epistemology of design that has inherited the task of developing the logic of creativity, hypothesis innovation, or invention that has proved so elusive to the philosophers of science.* (Glynn, 1985)

Polanyi held that all scientific knowledge is a question of 'passionate belief' rather than 'dispassionate proof' and that the methods of inquiry, the competence and judgments of the researcher, as well as the knowledge and principles already known must be taken into account before new knowledge was accepted (Rust, 2004). According to Cross, this concept is also inherent in Schön's theory of reflective practice, which suggests that there should be:

> *more trust put in the abilities displayed by competent practitioners, and to try to explicate those competencies rather than supplant them* (Cross, 2001, p.54).

In this research, practical methods used in design practice such as:

- brainstorming and concept mapping;

- visualisation – sketching, diagramming, storyboards;

- prototyping – paper and digital mock-ups;

were used throughout each stage of this study to gather, analyse, present and modify research material and outcomes. It was through the use of these practical visual methods that moments of 'illumination' occurred and led to significant findings at each stage, most notably, the Literature Map, the Practice Map, the Screen Typology (see Chapter 2) and the Practice Matrix (see Chapter 4). These findings, in turn, shaped the path and direction that the research followed.

The methods outlined below, were used throughout each stage of development of this research.

Online Research & Blog

Due to the topical nature of this research the majority of leading edge material focusing on screen typography and related digital issues, could only be found in online publishing sources. A significant number of online special interest groups, e-mail lists, and online resources dedicated to typography, motion graphics, web design and screen media technologies provided critical references throughout the course of the research.

RSS (Really Simple Syndication) information feeds and content aggregators provided a useful method for monitoring topics and information resources on a daily basis in order to keep the research current.

In an ongoing effort to address the issue of currency, an online research content management site, called *type4screen.com*, was developed as both a research method and outcome for this study (figure 1.5).
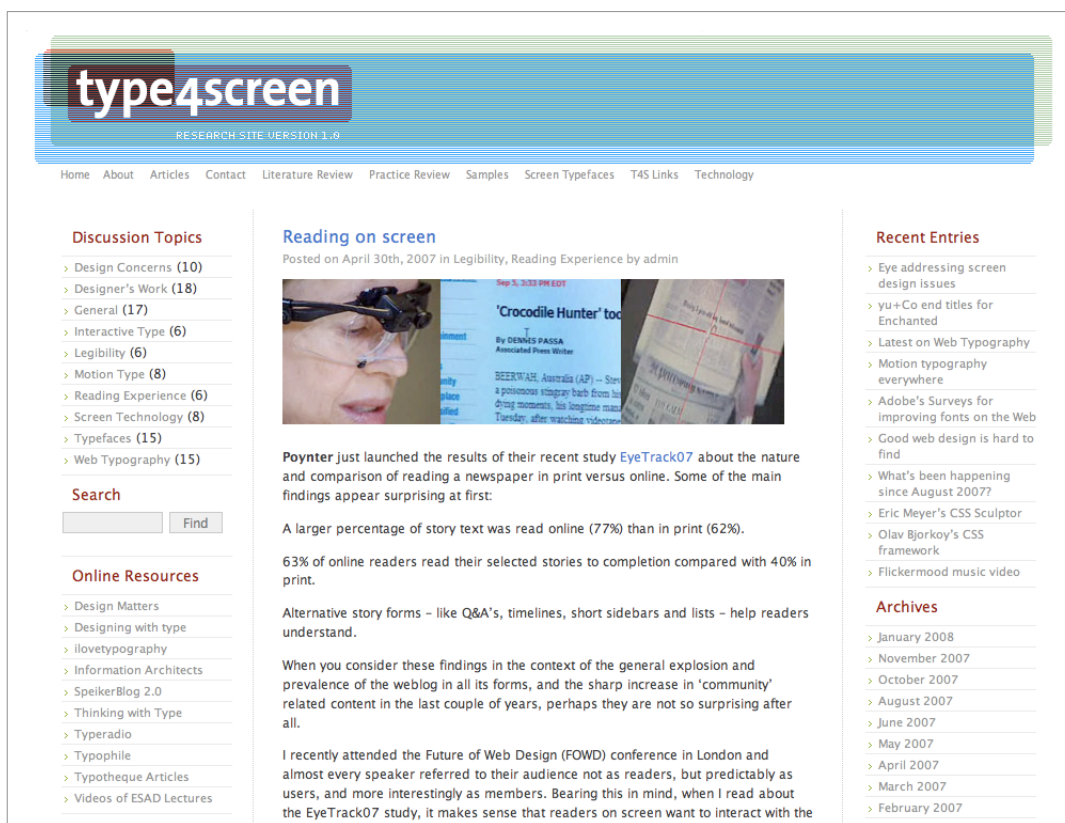
Figure 1.5 Screenshot from *type4screen* research website and blog.

The type4screen research site and blog acted as a live digital research notebook that was constantly updated and added to. It became a searchable digital archive of current research gathered from online sources. It was (and continues to be) an invaluable research tool, method and outcome that was (and is) used to:

- **track current developments** in the research field as they emerge by book-marking them, categorising (and tagging) them and commenting on their relevance;

- **create an archive of practical references** by bookmarking innovative practice examples that could be examined later;

- **record critical insights** as they occurred on a disparate range of material, which could be easily retrieved and used at a later date.

Using other online resources and the type4screen site, direct feedback and commentary from peers within the online community could be facilitated with ease. This proved an insightful means of providing additional primary material to the topical sources used in this research. Making contact with, and accessing the opinions of, leading designers, writers and educators can be sought directly through online forums, commenting facilities and notice boards of large online design and typographic resources. The following table (table 1.2) illustrates some of the main online sources used in this research.

Chapter 1: Introduction © Hilary Kenna, 2012.

Online Research Resources

Search Engines & Databases	Professional Organisations	Forums / Email Lists	SIG Community Resources / Blogs / Publications		Awards & Practice Showcases	Publishers & Book retailers
Search Engines/Wikis www.google.ie http://scholar.google.com/ http://typophile.com/wiki/start http://typophile.com/wiki/Organizations **Schools/Program listings** www.graphicdesignschools.com/ www.graphicdesignschooldirectory.com/ http://typophile.com/wiki/Education http://www.aiga.org/content.cfm/design-programs www.education.icograda.net/web/schools.shtml http://www.dandad.org/education/college-network.html www.hero.ac.uk/rae/Results/	Alliance Graphique Internationale (AGI) American Institute of Graphic Arts (AIGA) Association of Dutch Designers Association Typographique Internationale (ATypI) D&AD Institute of Designers in Ireland (IDI) Institute of Irish Creative Advertising and Design (ICAD) International Council of Graphic Design Associations (ICOGRADA) International Society of Typographic Designers (ISTD) Society of Typographic Aficionados (SOTA) The Letters Exchange The Type Directors Club Toyko The Typographic Circle Type Directors Club (TDC)	Typophile forums, including General, Design Critique, Build, Release and Type ID Board ATypI members list and forum AIGA Typography Forum	**Typography** www.ilovetypography.com www.typedu.org www.typeculture.com www.typoteque.com www.thinkingwithtype.com www.typographi.com www.microsoft.com/typography http://typophile.com www.wpfd.com www.rsub.com/typographic/ http://webtypography.net/ www.type4screen.com www.swisslegacy.com www.typeradio.org www.fontzone.com www.typo.cz/euro www.typeneu.com/ **Design** www.designobserver.com http://www.underconsideration.com/speakup/ www.crblog.com www.core77.com www.worrydreamer.net	**Design & Technology** www.coudal.com www.37signals.com http://weblogs.media.mit.edu/SIMPLICITY/ www.readwriteweb.com **Web Design** www.alistapart.com www.smashingmagazine.com **Motion Graphics** www.motionographer.com **Designers' blogs** http://swissmiss.typepad.com/ www.markboulton.co.uk www.subtraction.com www.aisleone.net www.thinkingforaliving.org www.swisslegacy.com Information/UI/UX www.informationarchitects.net www.worrydreamer.net	Dutch Design Awards 2006 DNAD Awards IDI Design Award winners ISTD Awards & Student Assessment Scheme TDC Tokyo Awards AIGA Design Archives Dutch Design Archive Smashing Magazine showcases Computerlove	**Publishers** AVA Publishing BIS Publishers Hyphen Press Idea Books IdN Lars Müller Publishers Laurence King Publishers MIT Press Phaidon Princeton Architectural Press Rockport Publications Rotovision Publishers Routledge, Taylor and Francis Group Thames and Hudson Verlag Niggli AG Wiley and Sons Publisher Yale University Press **Retailers** Ailibris (seconhand/used books) Amazon UK and Amazon USA Biblio (used & out of print) Magma Books Nijhoff and Lee Shipley's specialist art bookseller

Table 1.2 List of the main online resources used in the research.

The use of online methods for gathering, storing, sorting and documenting research sources in the challenging environment of rapid technological change and obsolescence proved invaluable. It was also extended into one of the practical outcomes of the research, namely the design and development of the *type4screen* practice blog (www.type4screen.com/practice). This website (see figures 1.3 and 1.6) incorporates a content management system to store, record and publish practical examples of screen typography. It includes the facility for peer contribution and feedback (via comments) and can be constantly added to and updated.
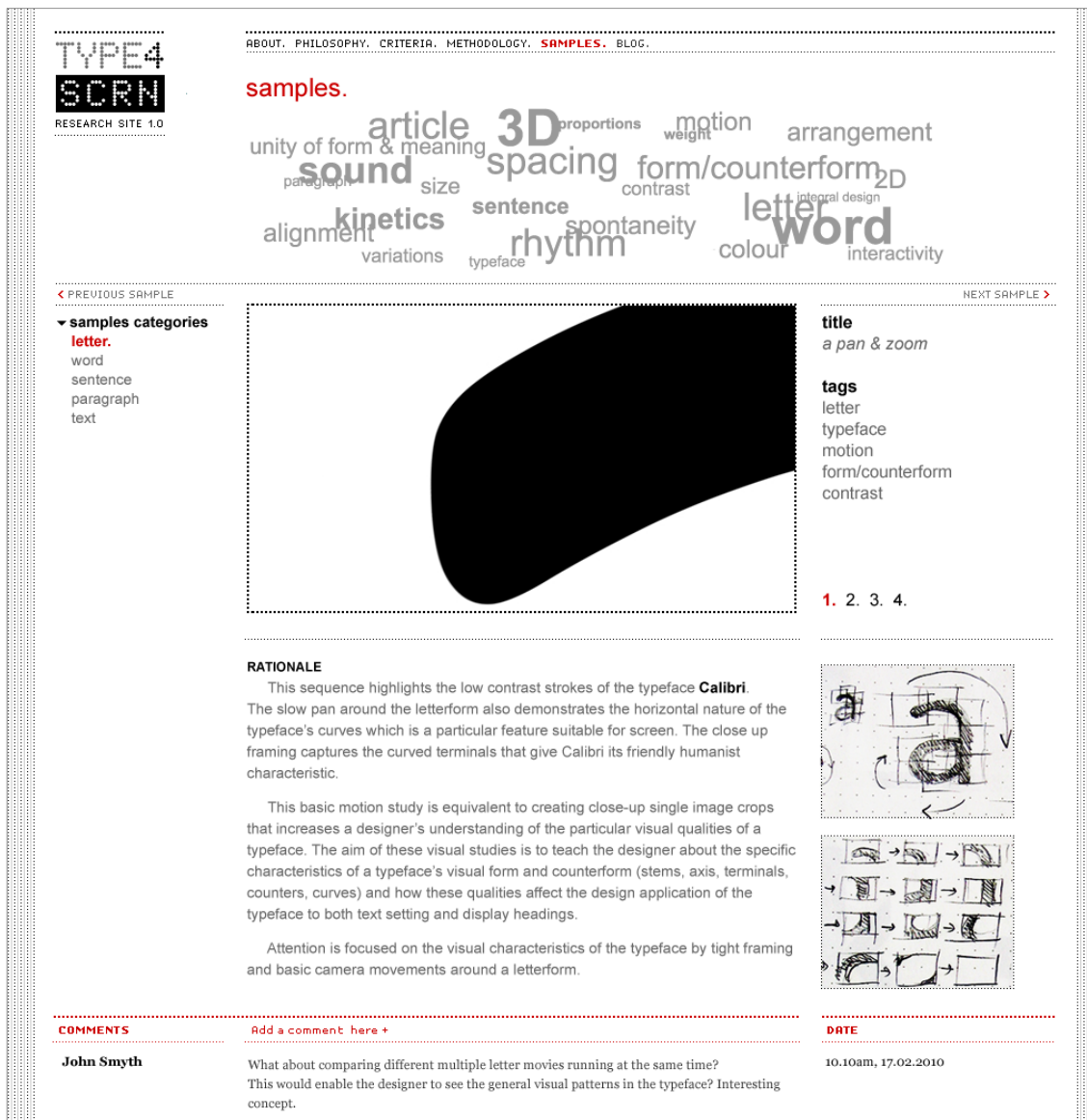
Figure 1.6 *Samples* page from type4screen practice repository, showing a single entry.

Visualisation and Mapping

The use of visual mapping and diagramming proved to be an invaluable (and intuitive) practical method throughout the course of this PhD study for uncovering macro and micro relationships between different and often seemingly incompatible aspects of this research. This method is recognised by many researchers as a useful method for finding, and making explicit, critical relationships that exist between complex and inter-related subjects (Lawless and Smee, 1998). It is also used widely within the graphic design process (Hiebert, 1998) and was therefore already familiar to the practice of the researcher.

The visualisation of critical ideas in this research through diagrams and schematics have been employed at each stage of investigation to support:

- the analysis of material for inclusion;

- the interrogation of selected material; and

- the explanation of newly developed material.

The effectiveness of using these visualisation methods is evident in the range of visual outcomes such as diagrams, tables, maps and typologies that appear throughout this thesis, and in their subsequent impact on the direction and focus of the research.

The following table (table 1.3) provides an overview of how visualisation was used in this research:

Research Objective	Visualisation as Method and Outcome
To map the scope and range of the research territory	• Sketches of related disciplines (see figure 1.) • Practice map (see figure 2.7)
To map the scope of relevant literature	• Preparatory sketches for literature map (see figures 3.1-3.5)
To visualise the stratifications within the literature	• Literature map (see figure 3.5)
To provide a visual overview of complex chronological and technological developments in relation to the environment of the screen	• Screen typology (see figure 2.2) • Screen properties (see figure 2.6) • Screen usage (see figure 2.5)
To explain written theories and methods of practice	• Ruder schematics (1-3) (see figures 6.1, 6.3, 6.5) • Practice matrix diagram (see figure 7.6) • Screen Typography Properties (see figure 4.119) • The Waste Land poem navigator (see Appendix III, figure 28)

Table 1.3 Use of visualisation methods in the research.

According to Professor Donna Cox (Director of Advanced Scientific Visualization Laboratory, NCSA, Illinois) the process of 'mapping attributes from one domain of information into another is how humans understand, create, and engender new meaning' (Cox, 2004).

It is exactly this method of mapping that describes how the problem of articulating the scope and definition of the research territory was resolved.

Three key areas relevant to this research: screen media, typographic literature and contemporary practice in screen typography, were interrogated initially using visualisation techniques.

The following set of sketches (figures 1.7–1.9) and their captions demonstrate how methods of visualization played a significant role in narrowing the focus of this research.

Figure 1.7 Sketch of related disciplines, topics and keywords.

To start with, the main areas for examination in typographic literature and screen typography practice were identified through a process of concept mapping the major topics and keywords relating them to the research field.

Figure 1.8 Concept sketch of related disciplines by theme.

Further visual mapping was used to aid the process of sorting, sifting and classifying the disciplines. After a process of iteratively sketching several concept maps the main areas were gradually distilled into categories and thematic inter-related strands under which relevant research material could be grouped and classified. These strands were later used in devising the Literature Map visualisation (figure 1.2).

Figure 1.9 Concept map showing areas related to screen typography practice.

The same process of iteratively sketching concept maps was used when trying to define areas of practice within screen typography. A more detailed account is provided in Chapter 2.

Other researchers have also found that concept mapping when used as a starting point for thought generation or as the means by which new meanings in the research can be expressed can lead to the creation of 'new insights' (Polma and Stewart, 2004).

It is hard to envisage how the sole reliance on written methods, without the use of visual methods such as these, could have led to identifying the central position of Emil Ruder and the significant trajectory of his influence on contemporary literature and practice (see figures 3.6 and 3.34).

Interviews

A focused qualitative methodology, which took the form of 'expert interviews' (Brown, 2009) with experienced practitioners, was used to gain critical insight and feedback on both the early definition and later development stages of the research.

This method was critically chosen over other qualitative methods such as surveys because of their traditionally low response rate and the difficulty in ascertaining a consistent baseline level of knowledge and experience in the respondent group (Cook, Heath & Thompson, 2000).

Focus groups, on the other hand, which may be carefully selected, were also deemed unfeasible for this research because of the inter-disciplinary range of expertise required and the availability of such a disparate group of experts in a single location at the same time. In addition, it has been proven that participants are often less forthcoming with their responses in a group context. It was therefore considered that individual interviews might yield more forthright information and opinion (Morgan, 1996), (Calder 1977).

Nine semi-structured interviews were conducted with experts from a range of relevant disciplines that were critically identified in chapter 2 (figure 2.7).

Discipline	Practice Context
Film Making and Production (1)	Education
Graphic Design and Typography (1)	Commercial
Motion Graphics (1)	Commercial and Education
Screen Typography / Web Design (1)	Commercial
Screen Typography / Data Visualisation (1)	Education and Commercial
Screen Typography / Computer Science (1)	Education and Commercial
Human Computer Interaction / Computer Science (1)	Education
Animation (2)	Education and Commercial

Table 1.4 List of Interviews by discipline and practice context.

The relevant disciplines include: graphic design and typography, web design and development, interaction/user experience (UX) design, animation, film, motion graphics, human computer interaction (HCI), art and design.

The candidates were carefully selected for their in-depth knowledge and experience in the practice of their discipline (for a detailed discussion of selection criteria see Chapter 7). Strategically, the aim of the interviews was to expedite coverage of the multi-disciplinary knowledge input required for this research. It was hoped that the interviews would yield a high level of knowledge and critical feedback in the interviewee's field of expertise, and provide a focused, informed response to the specific requirements of this research.

Presentation, Publication and Peer Review

A triangulated evaluation process was planned early in the research that would correlate the findings from the critical review of technology in literature and contemporary practice, with the practice outcomes, which would in turn be published for peer review. The following table (table 1.5) illustrates the range of peer-reviewed events and outcomes where different aspects, and stages, of this research have been presented for feedback to professional peers in industry, education and research.

PhD peer reviewed research activities					
Related Chapters	**Title**	**Event/Publication**	**Activity**	**Date and**	**Location**
Chapter 7	*Touching the text of T.S. Eliot's The Waste Land: a critical discussion of interactive design and screen typography for an iPad e-book.*	Book 2.0 Journal, Intellect Publishers, Bristol, UK.	Journal Article*	Dec 2012	Bristol (international)
Chapter 1, 6, 7	*Introduction to Practice-Based and Practice Led Research in Art & Design*	Lecture on Research Methods Module, Masters by Research Programme, IADT.	Guest Lecture	May 2012	Dublin
Chapter 2, 3, 4	*Screen Typography – an emerging historical and theoretical perspective*	Beyond Ink – ADCV 5th International Conference on Typography	Keynote Speaker*	June 2012	Valencia
Chapter 7	*Designing an iPad Book – The Waste Land App*	The Book: History and Practice, ATypI Workshop, University College Dublin (UCD).	Speaker*	Mar 2012	Dublin
Chapter 5, 6	*Evolving a Practice Methodology for Designing Screen Typography – with reference to the teaching methods of Emil Ruder*	IADT Design History and Theory Module – undergraduate Year 3 –	Guest Lecture	Dec 2011	Dublin
Chapter 2, 3, 4, 7	*Screen Typography: Words Made Usable*	TEDx Tallaght, hosted by South County Dublin Libraries	Invited Speaker	Nov 2011	Dublin
Chapter 7	*Anatomy of The Waste Land App*	Master Class for BBC and the British Arts Council as part of their Building Capacity in Digital Arts programme.	Industry Master-class	Oct 2011	London
Chapter 5	*Emil Ruder: A Future for Design Principles in Screen Typography*	Design Issues, Winter 2010, MIT Press, Vol. 27: 1, pp.35-54.	Journal Article *	Dec 2010	Boston (international)

Related Chapters	Title	Event/Publication	Activity	Date and	Location
Chapter 5, 6	*Evolving a Practice Methodology for Designing Screen Typography – with reference to the teaching methods of Emil Ruder*	ATypI (Alliance Typographique Internationale) Annual International Conference	Conference Paper *	Sept 2010	Dublin
Chapter 6	*A Practice Matrix for Exploring the Materiality and Aesthetics of Screen Typography*	ATypI (Alliance Typographique Internationale) Annual International Conference	Conference Workshop *	Sept 2010	Dublin
Chapter 7	*The Waste Land App –designing a screen reading experience.*	LCC PhD Graphic Design Forum (x 2)	Academic Seminar	Nov 2011 Apr 2009	London
Chapter 5	*A critical analysis of Emil Ruder's Typographie and its relevance to screen typography practice.*	LCC RNUAL Seminar	Academic Seminar	Feb 2008	London
Chapters 2, 3, 4, 6, 7		Interviews with professional practitioners (x 9)	Interviews	Nov 2007–May 2009	Dublin, London, New York
			* Peer Reviewed*		

Table 1.5 List of peer reviewed research activities for this PhD.

Application of Research in Design Practice

Throughout the course of this PhD study, the researcher has used every opportunity to apply knowledge acquired through the research findings to the design of the research outcomes. Criteria for good design and best methods of design on screen as identified by the research have been applied to all of the practice-led outcomes that this research has generated. Where possible, the design and typographic treatment of these outcomes have been optimised for screen usage. The practical applications of this research include:

- Various diagrams and visualisations such as: Screen Typology, Literature Map, Practice Map, Ruder schematics (x 3), Practice Matrix diagram.

- *type4screen* research website and blog

- *type4screen* practice repository website

- Various motion typography samples

- *The Waste Land App* for iPad

- On-screen slide presentations

1.8. Overview of Research Study

This research was conducted in a part-time capacity over the last eight years. Its trajectory has oscillated between iterative cycles of theoretical study, design practice, and open-ended exploration and experimentation.

This thesis describes the research journey and path of discovery that eventually led to key findings presented in this research. As previously shown in figure 1.1, the research was broken down into four distinct stages. The following diagram (figure 1.10) shows how the thesis structure emerged in relation to each stage.

PhD Thesis: Chapter 1: Introduction © Hilary Kenna, 2012.

Structure of PhD Thesis and Practice

Stage 1 Exploration + Definition

Chapter 2
Screen Media &
Technologies

**Research Question
& Territory**

Chapter 1
Introduction

Chapter 3
Typographic
Knowledge

*Design Principles
for Screen Typogarphy*

Chapter 4
Contemporary
Practice

Stage 1 Findings/Outcomes

- Screen Typology
- Screen Properties
- Screen Usage
- *type4screen* research blog
- Literature Map (Typographic Design Principles)
- Practice Map (Screen Typography)
- Screen Typography Properties

Stage 2 Analysis + Development

Chapter 5
Methodology

**Development
of Methodology**

Critical Focus on Emil Ruder's book
Typographie: Manual for Design

Chapter 6
Practice Methodology
& Application

Stage 2 Findings/Outcomes

- Ruder's Method: Schematics
- Lexicon of Screen Typography Principles
- *Practice Matrix*

Stage 3 Application + Iteration

type4screen
practice blog
website

**Application
of Methodology**

TWL Journal Article
(Book 2.0)

Stage 3 Findings/Outcomes

- Typographic Experiments
- **type4screen** practice blog
- *The Waste Land* App (TWL App)

Stage 4 Evaluation

Chapter 7
Application & Evaluation
of Practice Methodology

**Critical Review
of Methodology**

Chapter 8
Conclusions &
Future Work

Stage 4 Findings/Outcomes

- Revised *Practice Matrix*
- Draft Lexicon of Screen Typography Principles

Future Research

Figure 1.10 Diagram of Thesis Structure in relation to each research stage.

Thesis Overview

The following outline provides an overview of each chapter of the thesis and the research outcomes that occurred during each stage of the research.

After this introduction, chapters 2, 3 and 4 present a broad survey of the research territory in three main areas – screen media and technologies, typographic knowledge and contemporary practice. Chapter 2, entitled *Screen Media and Technologies,* presents a critical review of relevant media and technologies in order to establish a definition of 'screen' and its constituent underlying properties that exist irrespective of specific technological manifestations. This chapter provides an overview of the main technological developments, types of screens, their different usage contexts and the nature of audience interaction with them. There is also a critical comparison of print and screen media and an examination of the main factors affecting the legibility of typography on screen.

Chapter 3, called *Typographic Knowledge*, focuses on a critical review of typographic literature to identify the main practice models governing design practice. The literature is classified and structured into relevant thematic strands for, and about, the practice of typography. There is a broad discussion of the trajectory of the development of typographic design principles for print, and the perceived gaps to address design issues for the screen are identified. It was during the literature review phase, that the central location and influence of Emil Ruder's book, *Typographie – A Manual for Design* (1967), was identified as being especially significant to the direction of this research.

The fourth chapter, *Contemporary Practice in Screen Typography,* completes the critical review of the research territory with a detailed examination of contemporary practice in screen typography that has occurred primarily over the last three decades. Three core areas of practice in the field are identified as: motion typography, static/dynamic typography and interactive typography. A broad variety of practice examples from each area are critiqued according to criteria devised from chapter 2 (properties of screen figure 2.6, screen legibility tables 2.2, 2.3) and chapter 3 (traditional principles for design practice, tables 3.2, 3.3, 3.4) with a view to devising a master list of the properties and characteristics of screen typography. The design methods used, and the processes of production and publishing are also discussed in an effort to explain the full nature of screen typography practice and establish how it differs from traditional media.

The main findings from each of chapters 2, 3 and 4 complete the critical context review of the field in which the research is situated; and their impact on the direction that the research subsequently followed are presented in a summary at the end of each chapter.

Chapter 5, entitled *Methodology – Emil Ruder and Typographic Design Principles*, sets out a critical discussion about how the direction of this research has been influenced by the work of Emil Ruder. It explores the way in which this renowned Swiss typographer has influenced a practice-led PhD study focusing on the need for creating new design principles for screen-based typography. Specifically, it explains how Ruder's seminal book *Typographie – A Manual for Design* (1967), where

historical knowledge created for a print-based context, has made a sustainable contribution to the future development of typography within the context of the screen. In addition, this chapter re-examines the relevance of Emil Ruder's teaching at the Basel School of Design, and positions his work within a contemporary context. This chapter also formed the basis of a peer-reviewed paper in the academic journal, *Design Issues*, winter issue in 2010.

Using Ruder's *Typographie* as a critical foundation, chapter 6, *Practice Methodology and Application*, describes the development of an experimental practice methodology for screen typography. A detailed critical analysis of Ruder's book dissects the philosophy, theory and methods within it. These are mixed and re-assembled with other research findings from chapter 3 (typographic design principles for print) and chapter 4 (practical principles from other screen-native disciplines) to build a new experimental model for screen typographic practice.

The developed methodology, called *Practice Matrix* is presented in chapter 7, *Application and Evaluation*, for evaluation in a number of peer-reviewed contexts including, interviews with expert practitioners, conference presentations, journal publications, academic lectures and workshops. Based on a detailed analysis of the interview feedback, combined with the criticism gathered from the other sources, the practice methodology underwent a series of iterations, which are described here. The critical impact of the practical outcomes, that demonstrate the application of the practice methodology on the research findings are also detailed in this chapter. They include: a number of exploratory typographic samples, one commercial project (*The Waste Land App*) and the practice blog (*type4screen.com/practice*) for storing and critically reflecting on the practical samples made during this research.

The final chapter of the thesis, chapter 8, *Conclusions and Future Work*, recounts a summary of the main findings from each stage of the research in digest form and notes the main critical contribution to the field. Conclusions are drawn by critically reflecting on each of the main findings to outline how the research has engaged with practice, and practice-led research. Following on from this study, future areas of research and development in design practice, education and commercial application are identified and outlined. There is also a brief review of the critical impact of the research on the researcher's practice

There are four appendices accompanying the main text of the thesis which include the following:

I. **Bibliography & References** – this includes the full set of the bibliographic references used in this research.

II. **CD of *type4screen* websites** – this is includes a copy of the research blog and practice repository submitted at the time of writing. Both websites are live and currently in use and will likely include additional material if accessed via the internet URLs – *www.type4screen.com* and *www.type4screen.com/practice*.

III. ***Book 2.0* journal article**: *Touching the Text of T.S. Eliot's The Waste Land.* This is a pdf proof of the pages of the journal article, which is due for publication in December 2012.

IV. **Interview transcripts** – original unedited interview transcripts and correspondence for eight interviews that were conducted with expert practitioners in a number of design and screen related practice disciplines.

The Waste Land App (for iPad) also forms a key part of this submission but due to licensing restrictions it is not possible to distribute a copy of the app with the thesis. It is available via Apple's iTunes Store for download and installation on an Apple iPad tablet.

This chapter has established the background and motivation for the research question, which identifies a gap in traditional knowledge of design principles when used in a screen context. The discussion that follows charts the course of discovery in a seemingly broad territory, which led to findings that determined a narrower research focus on Emil Ruder and the subsequent development of an experimental practice methodology, and its initial testing, application and evaluation in practice.

Chapter 2: Screen Media and Technologies

2.1. Contextual Review of Research Territory

This chapter explains and outlines the first part of an expansive discovery phase which was undertaken in order to fully understand the seemingly broad territory in which this research is situated, with the aim of determining a viable strategy to address the proposed research question set out in chapter 1. The discussion in this chapter and subsequent chapters 3 and 4, presents the wide critical survey of the research territory that was carried out, and how the resultant findings informed a narrower focus, which determined the direction of the research.

> *Study is a searching in everything, in the smallest, in the most hidden, in good and bad.*
> *Then somehow a light ignites, and a single right way is pursued.*
> (Paul Klee, in Heibert, 1998)

One of the most difficult aspects of this PhD study was to define the research territory and the field of screen typography. There were three main reasons for this difficulty:

- **Newness of the field in comparison to print (over 500 years)** – moving image screens are just over a century old, while digital screens are less than four decades old. In comparison to printed typography, screen typography is still an emergent field;

- **Rapidly evolving and changing** digital screen technologies has meant that screen typography, its methods of production and modes of delivery are in a continual state of flux, constantly evolving in relation to new technological developments;

- **Lack of critical publishing** – the speed of technological change, coupled with the volume and variety of typographic work on screen, has made it difficult to publish critical reviews of the field in traditional academic formats. By the time articles and books (especially if peer reviewed) are published, they are usually out of date in relation to current developments in the field. As a result, most of the current critical publishing on screen typography can be found online in non-academic (often non-verified) sources.

The lack of precursors from which to draw upon necessitated a more expansive critical review of related fields in order to establish the research context (which included literature and practice examples) for this PhD. As a result, this research undertook a critical review in three areas:

- screen media and technologies (chapter 2);

- typographic knowledge and literature (chapter 3) and;

- contemporary practice in screen typography (chapter 4).

Together these three chapters form a contextual review of the field of screen typography.

The three areas above were identified through a process of critical question formation and conceptual mapping (see Chapter 1, figures 1.7, 1.8, 1.9). The process began with practice-related questions that led to technological and theoretical issues, and subsequently their affect on, or application to, practice. The following diagram (figure 2.1) and question sets show how the three areas were identified and how the knowledge required in each area was interrelated to the next.

Stage 1 Exploration + Definition
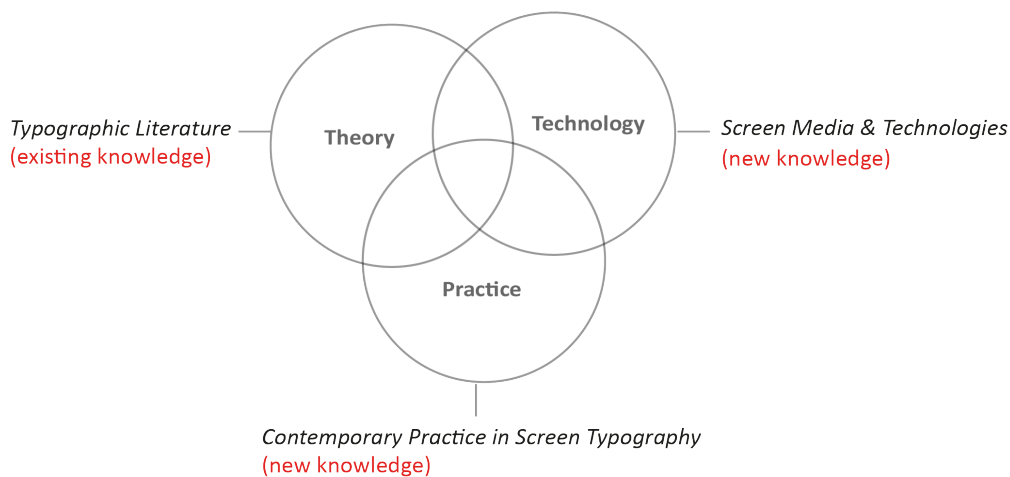
Figure 2.1 Diagram of Context Review

Question Set 1

• What is the nature of practice in screen typography?

• What are the main areas of practice – its origins, types of work?

• What are the main characteristics of screen typography practice?

• What are the best examples of practice? What are the criteria for identifying these best practice examples of good design on screen?

• What are the design principles governing the best practice examples?

Question Set 2

• What is the definition of a screen? What are the characteristics and types of screen displays and technologies?

• How does typography relate to these screens?

- What are the existing design principles for typography? Are they formally accepted and published? What happens when these are applied on screen? Do they work? If not what are the gaps?

- What screen-based disciplines are there? What are their principles for practice? Can these be applied to screen typography?

- How can this new and existing knowledge acquired in question set 2 be applied to answer question set 1?

Together, the critical reviews undertaken in each of the three areas, combine to form the contextual review of screen typography. It consists of a mix of new and existing knowledge (in relation to typography) from a range of different sources applied to answer the main research question – what are the design principles for screen typography? This chapter outlines the critical review of screen media and technologies.

2.2. Definition of the Screen

In order to understand screen typography, it was first necessary to gain a clear understanding of the nature of the screen environment and how typography operates within it. Of particular interest were: types of screen, their usage and whether or not it was possible to derive a generic definition of the screen and its underlying properties. In a seemingly vast field, this investigation was vital in framing the scope and limitation of the research.

The main objectives of this critical review were:

- To establish a broad definition of the 'screen' and its underlying properties in relation to typographic practice that is not based on a single specific technology;

- To clarify the nature and type of delivery screens, their usage contexts and related audience experience/activity;

- To identify the type and extent of typography practice on screen.

Definitions

As yet, the definition of screen, its manifest technological objects and environments is a relatively new and scarcely mapped territory in relation to typographic activity.

Acknowledging that the technology and artifacts of the screen may be in a state of continual flux, this research focuses on trying to derive a generic definition of the screen, that new media author and critic, Lev Manovich describes as the underlying characteristics that transcend a particular

device or technology (Manovich, 2006). Uncovering the key properties of what constitutes a screen, was critically important to the scope and sustainability of this research.

In the last couple of decades, rapid technological developments have ensured that the screen is fast becoming a competing substrate to paper for typographic output (Wisenbart, 2012). Screens now permeate every aspect of modern life, as more and more people are reading, and exchanging information on computers, laptops and mobile devices. Screens are increasingly becoming part of the urban environment as information displays, signage and advertising panels. In short, screens are everywhere, in your pocket, on the wall, in your car, along the street, at your desk, at the shops, all around us. Manovich describes contemporary western society as 'a society of the screen' where our daily lives are mediated through the screen, whether that is working, reading a newspaper, watching movies or communicating with friends (Manovich, 2001). Screens are rapidly becoming our primary means of accessing, consuming, creating and editing information.

According to Kevin Kelly, author and former editor of Wired, the shift from print to screen media has invoked a shift in our culture, from that of book literacy to one of visuality based around screens. While previous generations grew up with the belief in logic, precision, fixity, authority and stability of the printed word, contemporary society is experiencing a culture of the screen comprised of moving fluid, fleeting, continually changing moving images where 'truth is not delivered to audiences but assembled by them' (Kelly, 2008). Manovich concurs that the new generations of computer users and designers, who have grown up in a media-rich environment dominated by television and computers (rather than by printed texts), now preference the language of the screen over the language of print – and consequently an image-based world over a literary textual one (Manovich, 2001).

Other researchers have also noted this cultural transformation and its implications for the practices of artists and designers working with screens. The journal *Visual Communication* dedicated a special issue to examining 'Screens and the Social Landscape' in June 2006, which comprised of a series of articles examining the different ways in which a range of disciplines understand and use the screen as a means or vehicle for artistic and communication practice. In his book, *The Attention Economy: Style and Substance in the Information Age* (2006), Professor Richard Lanham of the University of California, identifies the screen as the primary stage upon which media communication and information compete for audience attention. Lanham claims that the screen offers a means by which new expression can be given to text in a way that cannot exist in printed form. According to Lanham text on screen inhabits a multimedia environment of sound, motion and interactive properties, which are the lifeblood of the 'attention economy', and it is therefore only natural that these characteristics present new typographic design challenges in a screen context (Lanham 2006).

Design critic and author, Jessica Helfand describes the screen itself as possessing a 'complex and variable presence in our daily lives':

PhD Thesis: Chapter 2: Screen Media and Technologies © Hilary Kenna, 2012.

> *...as a window, linking public space and private space; as an interface, providing closure and exposure; as a mirror, reinforcing the self and enabling reciprocity across electronically linked phone lines.* (Helfand, 2001)

This description highlights the inherent problem of defining 'screen' as either a single entity or as having a single purpose. 'Screens' appear to extend their range from painting to cinema screen, from computer desktop to touch screen tablets, and from mobile phones to public information displays. Just as the medium itself is difficult to classify and understand. It is also difficult to define the multifarious contexts for typographic design within this emergent form.

Genealogy of The Screen

Lev Manovich's genealogy of the screen provides a useful basis from which to begin situating typography within the screen environment and to examine the nature of audience engagement with different types of screen. Manovich describes three major developments in the history of the screen as: the classic screen, the dynamic screen and the real-time screen. Beyond his third development, this research references the work of author, historian and theorist of modern media culture, Ann Friedberg. Specifically her book *The Virtual Window: From Alberti to Microsoft* (2006) extends Manovich's genealogy to describe a fourth stage of development of the screen as augmented space. These four main developments in the evolution of the screen are described below, and help to determine what properties constitute a working definition of screen that will be used throughout this research.

The Classic Screen

Manovich describes the first stage of screen development as the '**classic screen**', a flat, rectangular surface intended for frontal viewing that exists in our normal body space and acts as a window to another space. This other space (inside the screen) has a different scale to our normal space and its proportions (landscape and portrait) have remained the same for centuries from painting to computer screen. It is difficult to map typography onto the classic screen in forms other than the poster or cover (book, record, CD). These formats present typography primarily as a framed image albeit with secondary and tertiary information.

The Dynamic Screen

The second distinctive development, Manovich calls the '**dynamic screen**', which emerged approximately one hundred years ago and retains all of the qualities of the classic screen except the image it displays change over time. It brings with it a certain 'viewing regime' that strives for complete illusion, asking the viewer to suspend their disbelief and identify wholly with the image

on screen. The viewer must concentrate completely on what they see in the window and the image completely fills the screen. Manovich notes that the dynamic screen is aggressive in its presentation because it functions 'to filter, screen out, take-over, render non-existent what is outside of the frame' (Manovich, 2001). Typography on the dynamic screen finds form in the motion typography of film titles, opening sequences, identity sequences and stings, television and online advertisements, promos, and experimental film and animation.

The Real-time Screen

The third, and most contemporary, stage in Manovich's genealogy is the '**real-time screen**'. It encompasses some of the qualities of the classic and dynamic screen, but is fundamentally different for a number of reasons. Firstly, it shows multiple, overlapping and co-existing images at once and the viewer (now termed user) has to concentrate on more than one image at the same time where different parts of the image (or windows) can correspond to different moments in time. Secondly, the images can change over time in real-time as users control what material they want to access and how they want to view it. Both of these qualities are fundamental principles of the GUI (Graphical User Interface), which Manovich declares is also the main property of the real-time screen.

Other scholars such as Charlie Gere, from Lancaster University, believe that the 'real-time' screen is derived more from GUI development than the world of cinema or television. In his essay entitled *Genealogy of the computer screen*, published in the journal of *Visual Communication* (V.5, 2, 2006) Gere, traces the path of the development of the modern computer screen back to early military warning radar systems and the work of Douglas Engelbart's Augmentation Research Center at Stanford Research Institute. Considering the real-time screen from the perspective of GUI development is significant because it foregrounds the interactive dialogue between the screen and the audience.

Manovich claims that the GUI completely disrupts the viewing regime associated with the classic and dynamic screen because it involves the viewer/user in a contrasting mixture of passive media consumption on the one hand and active media production on the other. On the real-time screen, a viewer/user's activities can range from selecting and editing, to reading and viewing, to creating and publishing. For this reason, the design of the GUI is centrally important to the viewer/user experience of the real-time screen.

According to new media scholar, Jay David Bolter, creating an experience 'without the interference of an interface', is the ultimate goal of GUI design. He calls it the quest for 'transparency' in the user interface (Bolter, 2003). Bolter suggests however that to improve the technology to the point of invisibility may be an endless pursuit because it is redefined with each new technology that emerges. Both the pursuit of a transparent interface to enable a seamless viewer/user experience,

and the constant technological development of the real-time screen present a serious challenge for defining typography in the 'real-time' screen environment.

Typography on the real-time screen encompasses all forms of textual material that is generated, edited and presented on a networked computer screen (desktop, laptop, tablet, console, mobile device etc.). Text in this multifarious screen environment may include user interface design, information content, experimental interactive texts, e-books, games, apps and all forms of motion typography. On the real-time screen typography can be described as interactive and experimental typography.

Screen as Augmented Space

Manovich, Gere, and Bolter provide a particular definition of screen which responded to early research of the early 2000s. More recently scholars such as Ann Friedberg have progressed some of these ideas to extend definitions of the screen and present alternative genealogies that are worthy of discussion here.

Friedberg's book *The Virtual Window: From Alberti to Microsoft* (2006) extends the definition of the screen into three-dimensional space. Her central thesis considers the screen as architecture, an expansion of the material built space, through the 'virtual window' of the film, television or computer screen. Friedberg's theory describes an 'architecture of spectatorship', where the viewer/user is caught in a phenomenological paradox comprising of: mobility (of images) and immobility (of spectator); materiality (of the space where the screen exists – office, theatre, home) and immateriality (of the screen image). The relevance of this definition is reflected in the increasing developments and prevalence of screens in environmental contexts. In everyday settings, the television now occupies primary focus in a room on the wall (much like a traditional painting) and has become an interactive entertainment and information window in our living space. In urban settings, the use of large screens for advertising and information display, are commonly becoming part of our architectural landscape.

Manovich also recognises the important architectural dimension of the screen, which he calls 'augmented space' where layers of virtual information can overlay the physical built space. Augmented reality (AR) interfaces, once a futuristic vision presented in science-fiction films or in the R&D laboratories of leading tech firms, are now a consumer reality evident in a range of smart phone applications. Viewers (consumers) can walk down a street and point their hand held screen (phone) at a monument to see when and who built it or they can use the GPS capability to pin point where the nearest train station is and get directions how to get there. It is even possible to use a smart phone to overlay virtual text translations on top of a textual object in the real world (a useful tool for reading foreign menus).

Like Friedberg, Manovich also claims that the phenomenological experience of the viewer/user in this 'augmented space' presents a complex design challenge, which may necessitate a rethink of practice (Manovich, 2006). Forthcoming technological developments such as the screenless screen, dubbed 'the sixth sense', by Dr. Patty Maes and her Fluid Interfaces Group at MIT, demonstrates how any surface on which interactive images can be projected can become an interactive digital screen. This indicates that Manovich and Friedberg's vision of the screen as environment and not just artifact is fast becoming a reality.

From a practice perspective of typography, this aspect is much newer than other forms of screen typography and is dependent on the use of bespoke screen technologies. Designers in this realm usually form part of broader design collaborations with architects, environmental designers, engineers and programmers. For the purposes of definition in this research, the spatial and environmental applications of screen typography relate to various forms of digital signage, installation pieces such as interpretative exhibits (in museums, retail centres etc.) or experimental artworks, and augmented reality interfaces.

2.3. Types of Screens

Returning to the subject of this PhD, the research primarily concerns itself with dynamic and real-time screens in broad terms, not the specifics of any single technology or the various different guises and hybrids they inhabit. A detailed examination of different screen technologies and product models is large enough to form a separate study in itself and is not the focus of this research. The added difficulty of keeping track of every current development is also beyond the remit of this study.

In an effort to illustrate the major milestones in screen technology and to situate typography in this broad and complex territory, a visual typology of the screen (figure 2.2) was developed to show the main different types of screens. For the sake of simplicity, the 'screen as augmented space' is represented as a 3D sphere with projected virtual screens on the typology diagram. The typology presents an approximate chronology but is not specific or accurate in terms of date or technology.

The main aims of the typology were:

- to show an overview of the types of screens on which typography exists;

- to identify the main typographic display technologies;

- to identify the underlying characteristics of these screens in relation to the design context for the typography that populates them.

Subsequently, parallel strands of development were mapped onto the typology including associated typographic display technologies (figure 2.2), audience activity and usage contexts (figure 2.5) to create a more comprehensive understanding of the nature of the screen environment (figure 2.6).

The following diagrams and their captions present an overview of the following:

- Display & Rendering Technology (figure 2.3)

- Size: Resolution – pixels per inch (ppi) (figure 2.4)

- Audience Experience (figure 2.5)

- Screen Properties (figure 2.6)

Screen Typology

classic
screen

dynamic
screen

real-time
screen

augmented space
screen

Figure 2.2 Screen Typology showing overview of different types of screens.

Screen Technology

LCD is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals (LCs). It is an electronically modulated optical device made up of any number of segments filled with liquid crystals and arrayed in front of a light source (backlight) or reflector to produce images in color or monochrome. The most flexible ones use an array of small pixels.

CRT (Cathode Ray Tube) is a vacuum tube in which electrons emitted from an electrode are focused onto a phosphorescent screen. The electrons are aimed so as to create an image on the screen.

Font rasterization is the process of converting text from a vector description (as found in scalable fonts such as TrueType fonts) to a raster or bitmap description. This often involves some anti-aliasing on screen text to make it smoother and easier to read. It may also involve "hinting", that is, the use of information pre-computed for a particular font size.

Anti-aliasing techniques from computer graphics are used to determine how much of each pixel is occupied by the letter, and then to draw that pixel with that degree of opacity. Edge of letterform rendered using opacity % value of letter colour against background colour.

Sub-pixel rendering is a way to increase the apparent resolution of a computer's liquid crystal display (LCD) or Organic Light Emitting Diode display by rendering pixels to take into account the screen type's physical properties. It takes advantage of the fact that each pixel on a colour LCD is actually composed of individual red, green, and blue or other color subpixels to anti-alias text with greater detail or to increase the resolution of all image types on layouts which are specifically designed to be compatible with subpixel rendering.

Examples: *Microsoft ClearType (2006), Apple Quartz (2007), Adobe CoolType (2000).*

TFT-LCD (Thin film transistor liquid crystal display) is a variant of liquid crystal display (LCD) which uses thin-film transistor (TFT) technology to improve image quality (e.g., addressability, contrast).

IPS (In-Plane Swithcing) was developed by Hitachi Ltd. in 1996 to improve on the poor viewing angle and the poor color reproduction. Its name comes from the main difference from twisted nematic (TN) panels, that the crystal molecules move parallel to the panel plane instead of perpendicular to it.

classic
screen

dynamic
screen

real-time
screen

augmented space
screen

− **black**　　　+ **white**　　+ − **subcapsule (hi-res)**

LED (Light Emitting Diode) based 7-segment display showing the 16 hex digits

Monochrome pixel display
Reflective STN LCD

E-ink (Electronic ink) is made up of millions of tiny microcapsules, about the diameter of a human hair. Each microcapsule contains positively charged white particles and negatively charged black particles suspended in a clear fluid. When a positive or negative electric field is applied, corresponding particles move to the top of the microcapsule where they become visible to the user. This makes the surface appear white or black at that spot.

Figure 2.3 Overview of screen technology.

Screen Resolution

PC
(c 1981)
320 x 200 px,
72ppi CGA
(IBM 5150 PC)

**Multimedia PC +
Internet Access**
(c. 1993)
640 x 480 px
72ppi VGA
4:3 aspect ratio

Mobile Phone
(1997)
84 × 48 px monochrome
(Nokia 6110)

Flat-Screen
(2009)
1920 x 1020 px
(42 inches)
16:9 widescreen aspect ratio
TFT-LCD/Plasma

Rollable Displays
(2010)
432 x 240 px (121 ppi)
4.1 inches
(Sony's rollable OTFT OLED display)

classic
screen

dynamic
screen

real-time
screen

augmented space
screen

Digital Watch
(c 1975)
LED-based
7-segment display
showing the 16 hex
digits

Handheld Games Console
(1989)
160 × 144 px
66 mm/2.6 in diagonal
Reflective STN LCD
(Nintendo Gameboy)

Laptop
(c. 2000)
1600 × 1200 px
32 bpp SXGA+ TFT LCD,
(Dell Latitude C800

Smart Phone
(2007)
320 × 480 px (163 ppi)
(iPhone 1)

(2011)
640 × 960 (326 ppi)
3.5 inches/ 89 mm in diagonal
1.5:1 aspect ratio widescreen
LED backlit IPS TFT LCD
Retina display
(iPhone 4s)

Resolution
number of pixels wide by
number of pixels high

Aspect Ratio 4 : 3	Aspect Ratio 16 : 9

PPI (pixels per inch)
pixel density per square inch of the
display

Tablet
(2010)
1024 × 768 px (132 ppi)
4:3 aspect ratio 9.7 inches / 250 mm in diagonal
XGA, LED-backlit IPS LCD
(iPad 1)

(2012)
2,048 × 1,536 px (264 ppi)
9.7 inches (250 mm)
color IPS LCD display with a 4:3 aspect ratio
(iPad 3)

Figure 2. 4 Overview of screen resolution.

As screen technology strives to match the scalability and portability of paper, the quality of resolution and image display often seems to take a retrograde step. There are stark similarities between the typography on a 1980's VGA monitor and mobile phones of the mid to late 1990's. The search for improved and higher resolution rendering technologies means the latest high quality screens may also be more expensive and take longer to reach mainstream use. Plasma television screens versus CRT television screens are one such example. However, like most new technologies, the first versions are usually expensive but after a short period (usually about eighteen months, according to Moore's Law), and several improved versions later, prices usually reduce considerably. This is true of screen technologies. Flat screen LCD televisions and computer monitors are now cheaply available and in mainstream use.

Additionally, different strategies to best render typography on screen have evolved in parallel with computer display technologies, including post-script and anti-aliasing, TrueType, OpenType and more recently Microsoft's ClearType which is specifically developed for improving the legibility of typography on LCD screens via sub pixel rendering.

The relentless march of technological advancement also means that standard formats are constantly being revised and remain in a state of flux. In this respect, it may seem futile to attempt to devise a typology of screen display and rendering technology, except for the fact that the examination helps to identify consistent screen characteristics that seem independent of resolution or device. These underlying characteristics and properties, not the specific inner workings of the technologies, are what concern this research.

2.4. Screen Usage and Interactivity

Screen-based contexts for typography

Using the typology developed in the previous section, this research also examines the associated usage context and the nature of audience interactivity for each of the main types of screen. Of critical importance to this study is understanding what, where and how people interact with text on screens. Based on the screen typology (figure 2.2), screen-based typography can be identified in three broad contexts, cinema, television and computer/mobile screens. The section below examines each one in detail.

Cinema

Typically characteristic of cinema is the large scale of the screen and the audience, and for the most part, the purpose of the representation on screen is entertainment, usually in the form of a narrative film. In this context, typography has a rich tradition, dating back to the earliest silent films where title cards communicated key dialogue or events in the narrative through to the golden age of film titles design in the 1960's (spearheaded by Saul Bass, Pablo Ferra and Maurice Binder) and its resurgence in the 1990's (with Kyle Cooper's landmark mini-narrative title sequence to *Seven*). Film studios and director's continue to capitalise on the visual impact of the title sequence to sell the content of the film, convey information and establish the film's identity and mood. Typography in this screen context might be described as largely image-based and interpretative and the audience activity here follows the viewing regime of the dynamic screen. Even though audiences are large groups sharing the same viewing experience, it is generally accepted there is little or no interaction between them. Some research, such as that of Martin Barker, Professor in Film and Television at the University of East Anglia, examines the problems and practices of studying audiences and their responses to film and television media content. However, the psychological, social and cultural response of audiences to screen media content is not the focus of this research. It is more concerned with the nature of audience interaction with the screen, in terms of what are the audience is doing and what activity they trying to achieve, for example, watching and listening while being entertained.

Television

In many ways, traditional television viewing echoes the regime of cinema, albeit on a smaller scale – the primary purpose remains social entertainment, although educational, information-based programmes and advertisements form a significantly large part of television's transmission output. Typography on television incorporates opening sequences, channel idents., listings, news, information and advertising graphics. Latterly, with the advent of interactive television, typography

also plays a significant role in the televisions interface representation. The viewer sits some distance away from the screen and operates/interacts with the television via a remote control. Recent research into motion typography for film and television includes the work of Barbara Brownie at the University of Hertfordshire, whose PhD study focuses on the behaviours of 'fluid' character forms in temporal typography and on developing typologies that will help designers and audiences understand them.

Networked Computer/Mobile Screen

The third and most complex context for screen typography relates to the computer platform and its integration with telecommunications. Broadly speaking, a single desktop computer or laptop with Internet access typifies the nature of representation and usage for typography in this area, which may also incorporate a diverse range of mobile devices such as smart phones and tablets. Typography in this context operates in the realm of Manovich's real-time screen, where the viewing regime is inextricably bound up with the GUI and the type itself may be dynamic, static and changeable, either by the publisher or the user. Typography on the computer screen has many functions and may appear in many forms, as an integral part of the interface, as textual content, as a dynamic sequence, or as an editable document. The nature of its representation may be image-based or information based, it may be interpretative and expressive or factual and objective.

The viewer or user may be the audience or author of a digital text, actively watching and reading it, or writing and publishing it. The integration of telecommunications with the computer make it possible for a single user at a single screen to communicate and connect with a multitude of other single users at single screens. This creates a multifarious and distributed community of authors and audiences, which in many ways are not unlike the audiences for cinema and television. The most significant difference is that author and audience may engage in direct dialogue exchanging points of view as well as content. While audience reception is not the primary concern of this research, understanding the different contexts in which audiences use screens, and the nature of how they interact with those screens is vitally for informing the appropriate design and usability of text on screen.

The following diagram attempts to visualise the three main screen based contexts for typography and to describe their associated audience interaction.

Screen Usage

| | classic screen | dynamic screen | real-time screen | augmented space screen |

Screen	*Cinema Screen*	*Television*	*Desktop Computer*	*Computer, Laptop, Smart Phone, Tablet*
Usage	**Entertainment**	**Entertainment**	**Productivity*, Entertainment**	**Communication*, Productivity*, Entertainment, Education,**
Activity	Viewing, listening	Viewing, listening	Viewing, listening, reading, typing, clicking	Viewing, listening, reading, typing, clicking, speaking, touching
Context	Public	Private	Public / Private	Public / Private
	Social	Social	Individual	Individual/Social

Communication* email, instant messaging, voice and video phonecalls and conferences
Productivity* searching, writing, creating, editing, publishing etc.

Figure 2. 5 Overview of screen usage and audience/user activity.

]

Screen Properties

The following list of generic screen properties was extrapolated from the earlier examination of the various types of screen displays and their usage contexts and audience activity as outlined above.

Property	Description
Multi-media	text, image, sound, animation, video, voice
RGB	light reflective colour (red, green, blue)
3D	virtual 3D (x, y, z axes)
Time-based	users control the time spent accessing screen content, this content may be static or dynamic (motion based) or live (updated and changing in real-time)
Variable Size/format	variable sizes and resolutions from – large and fixed to small and mobile mostly landscape orientation (with the exception of smart phone & tablet)
Connectivity	to other screens/users and internet access
Interactivity	
Devices	mouse, keyboard, touch pad/screen, stylus, microphone, camera, remote control (joystick, console control, pointer)
Actions	cut, copy, paste, select, edit, type, save, delete, draw, scroll, click, drag, tap, swipe, pinch & zoom etc.
Activity	read, watch, listen, speak, play, communicate, search, browse, scan, learn, interact (explore)

Table 2.1 List of screen properties. The list of properties in this table were drawn from diagrams Figure 2.2-2.5 and subsequently developed into the diagram below (Figure 2.6)

The list was used to create a diagram capturing the key properties of the screen (figure 2.6). Uncovering the underlying properties of the types of screens that typography inhabits, makes it easier to see how these properties may be projected on to, and reflected in, the design of typography on screen. In effect, the identification of these screen properties helped to identify the different forms of screen typography (figure 2.7) based on which of the above screen properties they encompassed. For example: interactive typography could be classified as typography that involves the user engaging with the text in an active (doing something) rather than passive manner (watching or listening), which may include online information-based text, e-books or text-based games etc. Motion or narrative based typography, on the other hand, is distinctive from interactive typography, because users are predominantly viewers, with little input to, choice over or control of the text they are engaging with. Thus, classifying screen typography is not straightforward, as both the nature of screens and their media content overlap, creating typography that can be simultaneously interactive, motion and information based.

Screen Properties

Multimedia

text, image, audio, video, animation,
(3D, motion, time, sound

Connectivity

mobile, ubiquitous,
dialogue & social network

Interactivity

type, click, write, touch, speak, point,
look, move/gesture

Virtual/Phyical

RGB light reflected, fluid size, focal points
infinite canvas, 2.5D & 3D layers, z-axis

Figure 2.6 Overview of screen properties. This diagram was developed from a distillation of all the previous diagrams and research in an effort to define the underlying properties of the screen without referencing specific technologies. Once these generic screen properties were developed, it was possible to overlay these against contemporary typography practice as part of the evaluation criteria to qualify work that represented screen typography. This led to the populated *Practice Map* (Figure 4.1) presented in Chapter 4. These properties were also incorporated into criteria for assessing contemporary work (see Chapter 4, p.158) and therefore made a significant contribution to developing the diagram *Properties of Screen Typography* (Figure 4.119).

Based on the knowledge gained through each visualisation (figures 2.2 to 2.6), a clearer understanding of the different forms of screen typography and what screens they exist on became clearer. Using these insights, a schematic map charting the main areas of practice in screen typography was devised. This diagram, or practice map (figure 2.7), was formulated on the basis of taking into account the types of screen and their associated audience usage/activity, the type of content presented and the characteristics (properties) of that content. Three distinctive but overlapping themes of practice were identified, as well as the particular practice perspective or design paradigm evident in that thematic area of screen typography. The associated practical disciplines (graphic design and print typography, film and animation, human computer interaction and game design) identified in each area suggested new and existing fields of knowledge that could contribute to the identification and formulation of practical design principles for screen typography.

The practice map was a key finding in relation to establishing the critical focus of both the literature and practice review that follow in chapters 3 and 4. The practice map is presented again in chapter 4, where it is populated with examples of different types of contemporary practice in screen typography that were identified. The practice map proved a useful tool for uncovering relationships between areas of practice in the research territory and for helping to identify the multi-disciplinary design principles required to address each of these areas.

Practice Map
Screen Typography
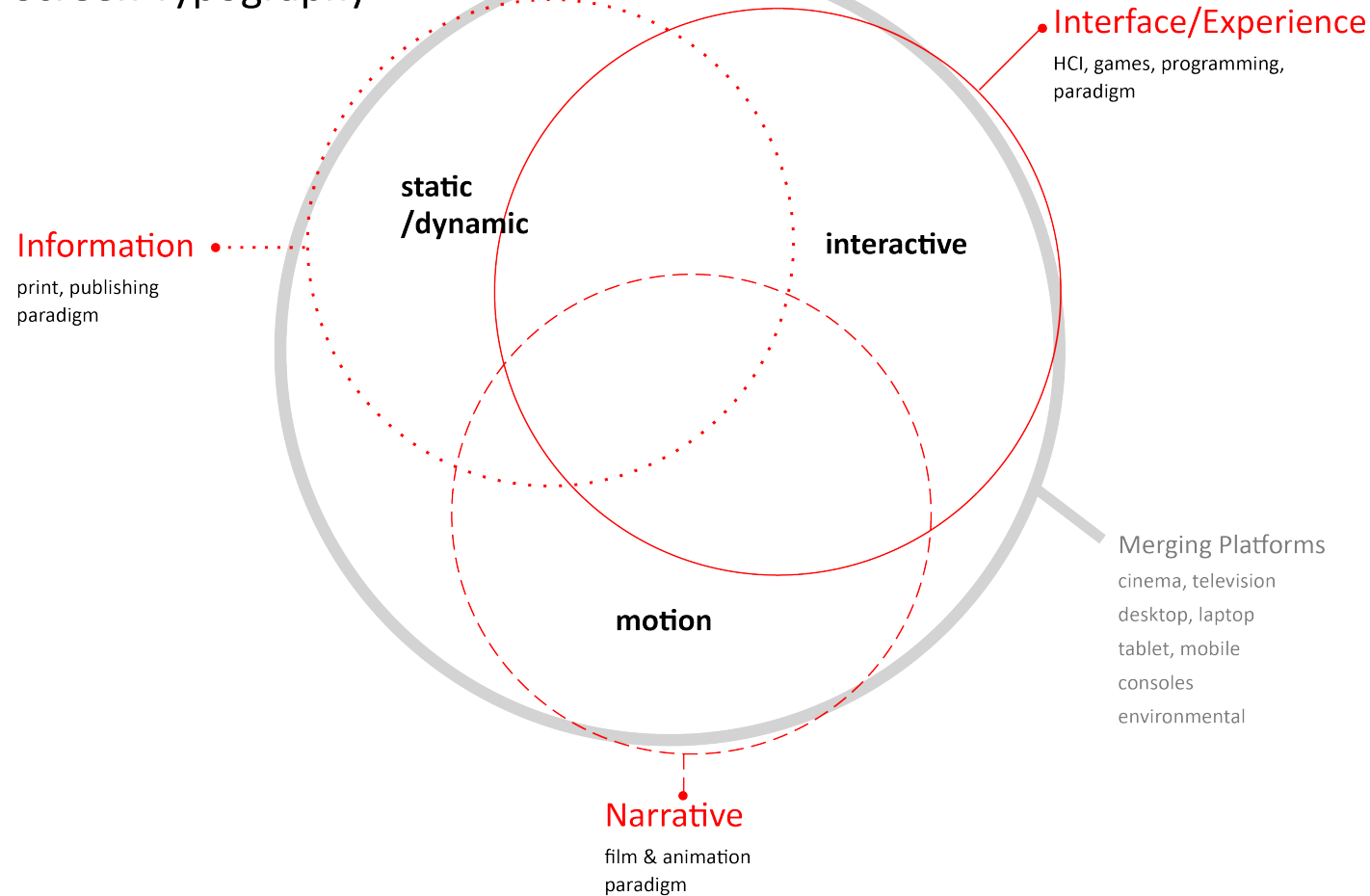
Interface/Experience
HCI, games, programming,
paradigm

static
/dynamic

interactive

Information
print, publishing
paradigm

Merging Platforms
cinema, television
desktop, laptop
tablet, mobile
consoles
environmental

motion

Narrative
film & animation
paradigm

Figure 2.7 Three main areas where screen typography practice occurs. This diagram was developed from a number of paper concept maps and multiple previous iterations drawing from the findings illustrated in diagrams (Figures 2.2-2.6 & Figure 4.1). Several attempts were made to draw a map illustrating the main areas of practice in screen typography and how they could be grouped or classified according to similar attributes or properties (Figures 1.7–1.9). Other earlier diagrams, not presented in the main thesis, are in Appendix V by way of explaining the development of this key diagram.

2.5 Comparison of Print and Screen Media

Analytical comparison of printed versus screen typography

Typography has been rooted in the tradition of the print medium for over half a millennium and it is only in the last twenty years or so that textual form has become prevalent on screen. The challenge for typography lies in trying to reinvent itself in the image-based medium of the screen that seems at odds with its print origins. The uneasy relationship between typography and screen might be further examined by a critical comparison of the nature and properties of print typography to its screen-based counterpart.

This comparison focuses on the following headings:

- Format

- Media

- Reading Experience

- Typeface

- Composition

- Hierarchy and Structure

- Tools and Delivery

Format

In this context, format means the physical form of the screen, its size, orientation and type of delivery device.

If we accept that screen and paper are distinctively single mediums (despite the variety of different types of screen and paper available), the question of format, and subsequently of scale and proportion, is a crucial design consideration for typography in either context. Similarities of scale are apparent, as we might compare the scale of the cinema screen to a billboard, or the mobile phone display to a business card, or even the desktop monitor to a standard magazine publication. (Note we are not comparing contexts of use here). There are possibly infinite variations of the scale and proportion of paper formats, and types of paper, that a designer has the control to specify. In comparison, the number of screen formats available is very limited, and is wholly determined by technological manufacturers. Designers of screen-based texts have to carefully examine and work within the constraints of a particular screen format or delivery platform.

In the print medium, a single page of content is displayed on a single piece of paper, and additional pages may be added as content increases in scale. A book represents the volume of its text in its physical form via larger paper size or thickness of the number of pages.

In screen-based media, all content is displayed within a single screen. This has necessitated the design of a variety of display and access interfaces that try to accommodate the problem of displaying and accessing large amounts of text on screen. These include: scrolling, zooming and panning, paging ('previous/next' or '1 of 5' etc. button or links), window panel overlays, coverflow and carousel displays. Scott McCloud, author and comic expert, calls this problem the 'infinite canvas' of the screen and suggests that any screen device is merely a window showing a portion of a much larger world.

Figure 2.8 Scott McCloud's 'Infinite Canvas' illustration by Craig Mod for *A List Apart* article, 'A Simpler Page', January 2011.

The key difference between screen and print formats is highlighted in the interface form through which we access and understand these formats. In the print medium, there has been little change to the page/book interface, from tableau, to scroll, to codex, in over five hundred years. Despite differences in scale or type of paper, the interface for print material is standardised. We are taught its convention from an early age when we learn to read. We understand how to read typography in almost all printed formats.

In contrast, as outlined earlier in reference to Manovich's screen genealogy, the interface form of the screen has changed dramatically over the course of its development. We have moved from watching the single moving image of the dynamic screen to multiple and varied activities with the real-time screen. Each type of screen (television, computer or mobile) and display technology may have a unique interface, and the quality and properties of typography may vary greatly in each. Designer and Associate professor at the MIT Media Lab, David Small, refers to this as a 'complexity barrier' that must be surmounted if typography on screen is ever to rival its printed counterpart (Small, 1999).

Media

A comparison of media use in print and screen contexts seems straightforward. Print uses text and image and the material qualities of paper such as texture, thickness, colour, opacity and its three dimensions. Screen media encompasses text, image, sound, motion and voice, all of which can be manipulated or responsive via interactivity. However, the relationship between print and screen is actually more complex.

Given typography's printed tradition, the design and integration of typographic and image-based forms has been thoroughly explored and documented in its five hundred year plus history. In comparison, the design of typography in a multimedia environment that includes sound, motion and interactivity is still evolving. The core contrast here perhaps, is that each media type (text, image, sound, animation) has its own set of unique properties and set of principles governing its design application. The design of typography in a two-dimensional print environment has been well traversed and a broad knowledge base of scholarship established. However, this does not hold true for the design of typography in three-dimensional and four-dimensional (time-based or real-time) environments, or for type that is auditory or interactively responsive. In her essay *Electronic Typography: The New Visual Language*, Jessica Helfand considers that to adequately develop this new typography, 'we might do well to rethink visual language altogether, to consider new and alternative perspectives' (Helfand, 2001).

A detailed critical examination of the practical design principles for typography that encompasses the diverse media characteristics of the screen is the main focus of this research.

Reading experience

The term 'reading experience' refers to issues relating to the audience interaction with a text, in both print and screen formats. Traditionally readability has referred to how easily a text can be read, while legibility relates to whether or not a text can be read. A wide range of scientific, psychological and typographic research has been published on factors affecting the legibility of typography (Tinker 1963, Dillon 1992, Dyson 2002, Larson 2004). There is less formal material available on the study of readability. The scope of readability in this comparison describes the overall sense of the experience of reading a particular text.

Printed material can be read anywhere the reader chooses, on a bus, at a desk, in bed, at the beach. While reading print, the reader's eyes move over the surface of the page, scanning the information, relying on the contrast and rhythm created in the typographic composition to guide them through the text. The surface of the page is still and the typography is static and fixed, presented exactly as the designer had intended, on carefully chosen stock and in a particular type design setting. The reader holds the printed piece in their hands and controls how much time they wish to spend

reading a particular page. The physical action is turning the pages and holding the book in their hands. The scale and nature of the physical paper format will also tell them at a glance how much text it contains. The text is already written and its order decided (executed by the author), the story is waiting to be read. The pace of reading and contemplation of the text is at the reader's discretion. As the reader becomes immersed in the 'reading space' inside their head, the book interfaces gradually disappears (Worthington, 1999).

The comparison to the experience of reading on screen is somewhat different. The reader's eye may move or it may be transfixed, scanning over and staring at the light patterns of text reflecting outward from the screen. The text may be static or dynamic, fixed or changing depending on the nature of representation, whether it is linear and time-based, or non-linear and real-time based or perhaps even a combination of both. The visual presentation on the surface of the screen will mostly likely be moving, either by animated presentation, or reader interactivity via the GUI such as selecting, opening, closing, scrolling etc. The reader is likely to sit in front of the screen (either at a desk or on hold it on their lap) and the physical interaction with the text will be usually via a mouse, keyboard or stylus. Alternatively, in the case of mobile smart phones or tablets, the reader holds the screen in their hands and touches its surface to interact with its contents. The reader is dependent on the customised interface of a particular screen text to determine its scale and order. The reading experience on screen may combine watching, reading and exploration through the interface. As reading interfaces (via Internet browsers, e-books etc.) are still evolving, and because we are not yet fluent in their use, it may be some time before the reading interface on screen metaphorically disappears in the same way as it does in print.

Recounting Bolter's and Manovich's earlier claims, in a context where the interface is not 'transparent', and the 'viewing regime' is disrupted by the GUI, it is less likely that the same type of immersive reading experience comparable to print will emerge on the screen. Author and psychologist, Victor Nell, who has conducted one of the few empirical studies on readability, states the extreme case of immersive reading as 'ludic reading', (from ludo in Latin, meaning to play) or reading for pleasure. When a reader achieves a ludic state of reading, they are literally 'lost in a book' (Nell, 1990). According to Bill Hill, head of Microsoft's Advanced Reading Technology, if the problem of ludic reading could be solved on screen, that is to make the reading experience as comfortable and natural as it is print, then the same solution could be applied to any other type of reading task on screen.

It is true to say that many contemporary e-book and e-readers have come a long way towards this goal of creating a reading experience similar to that of reading a book. About the same size as a paperback, amongst the most popular are the Amazon Kindle (600 x 800, 167ppi), the Sony e-Reader (600 x 800, 170ppi) and the Nook e-Reader. They have relatively high resolutions and pixel density, which improves the legibility of text on screen. Most have low contrast e-ink displays, which is a display technology designed to mimic the appearance of ordinary ink on paper. Unlike conventional backlit flat panel displays, which *emit* light, electronic paper displays *reflect* light like

ordinary paper. This effectively means these devices can be read outside in natural daylight in the same way as a paper book.

More recently, crossover platforms such as touch screen tablets, namely Apple's iPad, Samsung's Galaxy, Hewlitt Packard's TouchPad, and Amazon's Kindle Fire are becoming the next generation of e-readers. These devices are about the size of an A4 page and can be read in portrait or landscape mode. They are high resolution, full colour, touch screen computers that can be used for a variety of purposes (email, browsing the Internet, playing music, video conferencing, creating and editing documents and photos etc.) besides reading e-books.

One of the major examples of practice, which demonstrates the application of findings from this research, is the design of an iPad e-book which will be discussed later in Chapter 7.

Typeface

Typography in printed form can be reproduced to the highest resolution and every detail and nuance of a typeface will be rendered accurately. Consider the average 'book quality' image-setter uses 2,500 x 2,500 dots per square inch, or over 6 million bits of information. Until recently, the average computer screen offered less than 100 pixels squared (usually 72ppi, 96ppi), which adds up to about 5,000 bits of information. This is less than 1/1000th of the resolution of the common book, and considerably less than a common 600dpi office laser printer (Sassoon 2002).

Trying to render the detail of a serif typeface, especially at a small point size on screen will unlikely match the fine detail of its printed counterpart. It is also important to note that the smallest unit of display on screen is a pixel – which is a hard-edged rectangle or square shape. There are no curves or circular forms necessitating the use of techniques such as anti-aliasing and sub-pixel rendering detailed earlier in this chapter in figure 2.2.

It is hardly surprising that typefaces on screen are poor approximations of their printed counterparts and that legibility has remained a key concern. Latterly, with the introduction of higher resolution screens both in terms of size and pixel density (132ppi, 167ppi etc.), this has somewhat abated. But for most designers and readers of screen texts, the selection and effective use of a typeface suitable for screen reading is still a prevalent issue.

To date, much research into screen typography has focused specifically on developing better ways to render type within the low-resolution display environment of the screen. These include technologies such as Postscript, TrueType, OpenType, ClearType and CoolType. Technologies such as these are not the specific concern of this research but are outlined earlier in this chapter (see figure 2.3). Other developments to counteract the low resolution display of screens has been the design of screen specific typefaces, such as *Verdana* (1996) and *Georgia* (1993) both designed by Matthew Carter for Microsoft, and the wide range of pixel aliased fonts, amongst the most well known is *Unibody* (2003) designed by Underware.

While Apple pioneered specially designed typefaces (*Geneva*, *Monaco* by Susan Kare) in the GUI of their operating system as well as the inclusion of a wide range of typefaces shipped with their computers, Microsoft has made its research into typeface design for the screen publicly available. The Microsoft Typography Group and the Advanced Reading Technologies Team have commissioned research in the areas of screen legibility and typeface design.

In 2004, Microsoft's Typography Group staged a competition to design new screen-friendly typfaces that would be shipped with its new operating system Windows Vista. Some of the world's top type designers were invited to enter and 6 of the 26 submissions fonts were selected. Microsoft then hired each winning designer to design the entire typeface. The results were two serif faces, called *Cambria* and *Constantia*; two sans-serif faces, *Calibri* and *Corbel*; a flared-serif face, *Candara*, and a monospaced face for programmers, *Consolas*.

Calibri	**Calibri**	*Calibri*	0123456789@
Cambria	**Cambria**	*Cambria*	0123456789@
Candara	**Candara**	*Candara*	0123456789@
Consolas	**Consolas**	*Consolas*	0123456789@
Constantia	**Constantia**	*Constantia*	0123456789@
Corbel	**Corbel**	*Corbel*	0123456789@

from: www.SuperWasp.net/weblog

Figure 2.9 Microsoft Vista 'C' Fonts 2007.

These six fonts were shipped with Vista in 2007 and remain part of all Microsoft's OS. *Calibri* replaced *Arial* as the default font in Microsoft Word ensuring the widespread use of these fonts beyond Windows users. Information published about the design process of the 'c' fonts as they have become popularly known (Torre, 2005), coupled with commissioned research around their legibility and usage (Larson, 2007) and other relevant legibility research (Dyson 2002, Chandler 2001) have helped to identify the main design issues and characteristics for a typeface that is suitable for screen usage as follows.

The low resolution of the screen (average 100ppi) and the limited capability of its smallest rectilinear unit (1 pixel) to render fine detail especially at small sizes, typefaces with the following attributes are **less suitable for screen**:

Attribute	Sample font	
high contrasting strokes	**Hamburger**	Britannic Bold
hairline serifs	HAMBURGER	Trajan
oval or high curves	**Hamburger**	Futura Condensed
small x-height	Hamburger	Times New Roman
small counters	e	Archer Bold
narrow character widths	Hamburger	Din Condensed
oblique angles or axes	*Hamburger*	Times New Roman Italic
sharp or angled terminals	*mnr*	Palatino Italic
script-based or complex calligraphic letter forms	*hamburger*	Edwardian Script

Table 2.2 Typeface characteristics less suited for good screen legibility.

Conversely, typefaces with the following attributes are more **suited to screen usage** as follows:

Attribute	Sample font	
low contrast strokes	Hamburger	Cambria
sans serifs	Hamburger	Calibri
heavier horizontal or triangular serifs	Hur	Cambria
strong and horizontal joins	gmk	Cambria
heavier diagonals	Hamburger	Constantia
large x-height	Hamburger	Constantia
large open counters	aepg	Consolas

horizontal curves	cabe	Candara
vertical angles and axes	ru	Consolas
straight or rounded terminals	Hamburger	Calibri
generous character widths	Hamburger	Verdana
clear simple letterform design	Hamburger	Calibri

Table 2.3 Typeface characteristics for good screen legibility.

It is worth noting that typefaces with attributes suited to screen usage require careful design application because of their nature. For example, with the use of low contrast screen typefaces, which typically come in only four weights: regular, bold, italic and italic bold; it is more difficult to achieve contrast within the typographic design. The design application of typefaces suited for screen will be discussed in the practical application of the research detailed later in chapter 7.
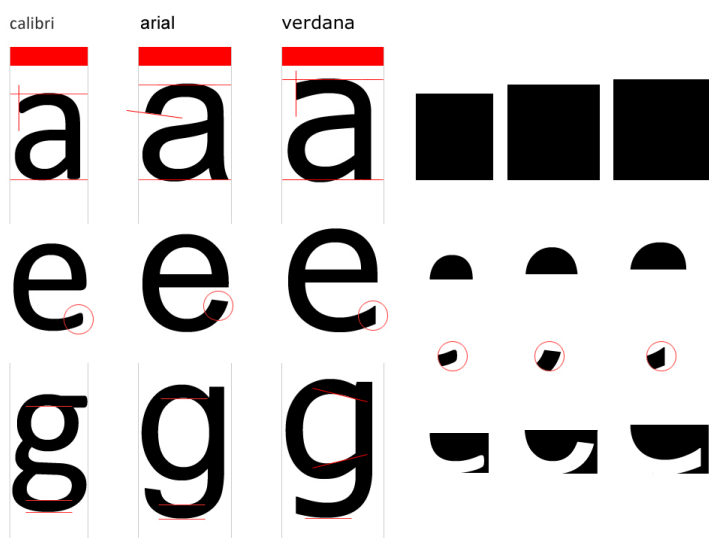
Figure 2.10 Visual comparison of typeface characteristics of Calibri, Arial and Verdana.

In the last couple of years there have been major developments to make a greater range of typefaces (other than the web safe fonts) available for screen use particularly in web publishing. Various technologies like Cufon, sIFR and FLIR tried to work around the problem of specifying fonts in a web page that were not installed locally on end user computers. However, it has really only been the release of the @font-face CSS rule for HTML generated text that has made significant progress in making a broader range of typefaces available for web design.

The W3C (World Wide Web Consortium) published the @font-face as a CSS rule, this allows a webpage designer/developer to download a particular font from their server to render a webpage if the user does not have that font installed. Whilst @font-face is not without problems, notably one of the major issues with it is compatibility of font formats across browsers, it has spawned a major turning point in the development and distribution of fonts for the web and other screen usage such as app design. All of the major traditional typeface foundries are being forced to offer (or will upon request) @font-face licences for their fonts. A number of dedicated web foundries such as *Typekit* (www.typekit.com, recently acquired by Adobe), *Google Web Fonts* (www.google.com/webfonts), and the independent *Font Squirrel* (www.fontsquirrel.com) have sprung up offering a range of fonts that can be licensed for online publishing. These new foundries are revolutionising the way fonts have been traditionally sold, licensed and distributed.

From a design perspective, despite the increased availability of different typefaces, the critical selection of a typeface with suitable characteristics for screen usage, coupled with design application that is cognisant of the limitations of screen display, remain key considerations.

Composition

It is worth comparing the differences in typographic composition between print and on screen. As mentioned earlier (figure 2.6), a designer can specify any format they wish in which to compose their design. Once chosen, the edges of the page become a definitive boundary governing the placement of typographic elements. The 2D flat surface of the page focuses relationships of size and placement on the x and y axes.

On screen, the designer will usually work with a number of fixed sizes or resolutions that relate to specific screen types, for example:

- television (PAL 768 x 576, DVPAL 720 x 576, DVPAL widescreen 1050 x 576)

- computer (800 x 600, 1024 x 768 etc.)

- mobile (120 x 130, 640 x 480 etc.)

- tablet (1024 x 768)

For the most part the proportions and aspect ratio on screen is either 4:3 or 16:9 landscape orientation with the exception of some smart phones and tablets which can change dynamically to

portrait orientation when turned on their side. This is the frame within which typography can be composed on screen. Considering how to compose multiple pages of text in the single frame of the screen is the key difference to composing type in print. Designers working on screen have to consider dynamic strategies for composition such as animation, layering, scrolling, scaling, stacking, panning and zooming. The time-based nature of these strategies suggests that the composition frame (or screen) appears to be the viewing window that captures different moments of the composition. The screen edges are not the boundaries, as the composition begins and continues outside of the frame, passing through in a form guided by animation or viewer interaction.

The screen also possesses an intangible quality because of the virtual space inside it. It means that composing type in this virtual space can be considered on the x, y and z axes. Time might also be considered the fourth axis. The complexities of managing the relationships between typographic elements across these four dimensions presents new design challenges when compared to the two dimensional composition of print.

Hierarchy and Structure

Following naturally from composition is a discussion of typographic hierarchy. Traditionally designers have used the nuance of typographic expression via different weights and size, coupled with logical, and linear ordering to denote the informational hierarchy within a printed piece. In contrast, there is a limit to what the pixel can render on screen and the nuance of a typefaces' weight and detail, especially hairlines and serifs, are inevitably compromised. The advent of 'hypertext', which Bolter calls 'the typography of the electronic medium', has also challenged the traditional linear ordering of text, making it possible to create layers of additional meaning accessible through programmable associative links within the text. Hyper-linking between different texts facilitates multiple entry and exit points to and from a text, resulting in a seemingly non-linear structure. It can often be difficult for users to understand and follow the hierarchy of a digital text. This variable form coupled with the dynamic and aural properties of multimedia combine to create a confusing palette for the designer to choose from. Jessica Helfand aptly sums up this challenge questioning the value of typographic choices such as bold and italics, 'when words can dance across the screen, dissolve, or disappear altogether?'(Helfand, 2001).

Information architecture, navigation structures and accessibility routes have become the new design parlance for screen typography. Designers of screen texts must consider how to design the structure of a text (information architecture) into discreet pieces, which can be accessed sequentially or from multiple routes in any order. Digital texts may be structured like a tree structure beginning from a central starting core before splitting into multiple linked branches as the reader progresses deeper into a text.

PhD Thesis: Chapter 2: Screen Media and Technologies © Hilary Kenna, 2012.

Even though designers will naturally structure texts into logical progressive pathways, the reader may choose to access a text in any number of ways. This necessitates the need for designing a navigation system for screen texts, which enables a reader to understand:

- where they currently are in a text;

- where they can go;

- how they can get there;

- and be easy and engaging enough to help them do so.

Outside of designing the form of text on screen, designers have to be cognisant that the culture of screen is different to the culture of print. In her book, Thinking with Type, Ellen Lupton, stresses that the impatience of the digital reader arises from the cultural habits of the screen where users expect to feel 'productive' not contemplative, 'they expect to be in search mode, not processing mode' (Lupton, 2004).

Other digital media critics such as David Dobbs also consider that screen reading creates a different kind reading behavior than on paper. In his Wired article, *Screen versus Page Reading*, Dobbs notes the lack of physical proportions of a text on screen inhibits our ability to grasp a macro understanding of the main argument within a text. The proximity of the screen, and the ease of digital editing of every detail of a text (cut, copy, paste), coupled with the constant distraction of hyperlinks make it more difficult for readers to get the critical distance required for a holistic understanding of a text (Dobbs, 2010). Dobbs suggests that screen reading is 'non committal', because it is just one of perhaps many tasks the reader may be simultaneously engaged in on screen.

Typography in this context seems to be more about alleviating the experience of prolonged reading on screen rather than encouraging it. Designers use strategies, perhaps borrowed from editorial design, to serve up chunks of text designed to suit the perceived reading habits of browsing readers.

Tools and Delivery

Some of the tools for the design, layout and production for typography are used for both screen and print media. The following table is indicative of the more popular software tools in mainstream use by designers.

Tool	Purpose for Typographic Design	For Print	For Screen
Adobe InDesign	Document layout and design	Y (primary usage)	Y
Quark Xpress	Document layout and design	Y (primary usage)	Y
Microsoft Word	Document generation, editing and layout	Y (primary usage)	Y
Adobe Dreamweaver	Webpage layout and design, HTML/CSS web typography specification	N	Y
Adobe Fireworks	Webpage graphics and production,	N	Y
Text editor	HTML/CSS web typography specification	N	Y
Adobe Illustrator	Typo-graphics, logotypes, page layout	Y	Y
Adobe Photoshop	Typo-graphics, web page and screen design mock-ups	Y	Y
Adobe AfterEffects	Design and production of motion graphics and typography	N	Y
Adobe Premier	Video titling and animation and editing	N	Y
Adobe Flash	Design and production of motion graphics and typography, Screen design prototyping	N	Y
Apple Motion	Design and production of motion graphics and typography	N	Y
Apple Final Cut Pro	Video titling and animation and editing	N	Y
Adobe Catalyst	Screen design and user interface design prototyping	N	Y
Microsoft PowerPoint	Presentation graphics, animation and typography		Y
Apple Keynote	Presentation graphics, animation and typography		Y
FontLab Studio	Professional typeface design	Y	Y
Fontographer	Typeface design	Y	Y

Table 2.4 Table of Tools used for typography generation, design, composition and production.

There is a stark contrast between the final delivery of a text in its designed typographic form in print and on screen. Post proofing and following successful press checks, print designers can generally feel secure that the finished manufacture of their design will manifest itself exactly in the same form they specified. They have detailed control over each stage of the design and production process, with the exception of final printing, but even then a conscientious designer will press check the first proofs of a job to ensure its accuracy. It is difficult to compare this process to the design and production of screen typography because of the multifarious nature of both screen hardware, software and design usage contexts.

For example, a web designer has to consider a range of technical constraints: what web safe or screen friendly typeface to use and what development environment (HTML/CSS, flash, font-embedding) to produce the design. Many designers will also rely on a programmer to build some, or all of their design on screen. Assuming this reaches a satisfactory conclusion, the designer still has no control over how it will be accessed or if the audience will access and view the design in the way it was originally conceived. This is because the audience/readers will all have different

computers, software (browsers) and monitor sizes. They may also adjust settings that override the designer's specification.

In effect, because the final delivery mechanism is variable and the viewer may also intervene in it's final transmission, designers must be willing to compromise absolute control over the final design outcome. They may need to consider the design as specifying the optimum set of aesthetic variables that work within the delivery framework. Designing flexible and fluid frameworks that form appropriate text layouts when publishing on different screen devices is now an emerging area of screen design called 'Responsive Design' (Marcotte, 2010). It combines both creative and technical skill in order to understand and create typographic design specifications and compositions that are suited to the different screen platforms (desktop, laptop, mobile, tablet) upon which the same core text may be read.

2.6 Legibility Factors for Screen Typography

The main evidence of theoretical publishing in relation to screen typography occurs in relation to scientific research of legibility issues (Chandler 2001, Dillon 1992, Dyson 2004, Lund 1999). However, these studies are often conducted in an artificial context where content is divorced from its design context in order to meet empirically driven research criteria. Legibility is affected by many variables (reading ability of subjects, environmental factors, display technology, nature of content etc.) other than aspects of typographic design and control, and it is only through the combined knowledge of these discrete studies that a useful overview of the findings in this area of research may be found.

Interestingly, within the mainstream of graphic design and typography practice, there is much less evidence of recent legibility research being conducted for either print, or screen environments. According to Wim Crouwel, legibility is hardly an issue any more as 'designers seem to have lost interest in the discourse on this subject', compared to the sixties when every conference or symposium on typography listed legibility as a theme in its programmed schedule (Crouwel, in Jury 2001). Crouwel, a self-confessed staunch modernist typographer, blames the radical break with tradition, revolutionary technological inventions and the post-modern development of a 'new visual language' where typography has been 'rebelliously violated' to be the cause of this disinterest. However, Crouwel's prophetic words ring a familiar tone when he stresses that regardless of what comes next, it is of the 'greatest importance' to learn from the experiences of the past.

The legibility of text on screen is determined by a number of factors. The earliest and most notable published research on legibility and typography (for print) is by Miles Albert Tinker, a psychologist and professor at the University of Minnesota, and by Herbert Spencer, a type designer and senior research fellow at the Royal College of Art from 1966 to 1978 who set up the Legibility Research

Unit. Both men published a wide range of typographic legibility research over the course of their careers culminating in two seminal publications: *Legibility in Print* (1963) by Tinker and *The Visible Word* (1969) by Spencer.

Tinker's and Spencer's methodology and findings have formed much of the basis of subsequent legibility research as well as informing the guiding principles for good legibility in typographic design practice but they also provide a framework for exploring screen legibility.

Amongst the most notable empirical research on the legibility of text on screen is the work of Professor Andrew Dillon, a psychologist at the School of Information at the University of Texas at Austin. Dillon carried out a series of tests with controlled sample groups reading contiguous text on computer monitors, to systematically analyse the main issues affecting legibility. The differences he observed between reading from screen and reading on paper, are described under the following headings: speed, accuracy, fatigue, comprehension and preference (Dillon, 1992). They continue to form the main criteria for examination in contemporary studies.

The main causes of these differences are noted by Dillon as: orientation, eye movements, visual angle, aspect ratio, dynamics, flicker, image polarity, display characteristics, anti-aliasing and user characteristics. This list forms the criteria against which all screen technologies have since been striving to improve in order to achieve an onscreen reading experience that is comparable to print.

A detailed discussion of the various legibility research studies that have been conducted for screen are too lengthy to examine within the scope of this research. Therefore, the following summary outlines the most relevant findings in relation to this research compiled from publications that include: (Dillon, 1992 & 1992, 2006); (Dyson 2001, 2002, 2004); (Larson, 2004, 2006, 2007); (Quinn, 2005); (Sheedy, 2005); (Stark, Edmonds & Quinn, 2007).

General Factors
Positive presentation combined with a high screen resolution to avoid flicker can produce good images and with the addition of anti-aliased characters it becomes possible to provide a screen display that resembles the print image and thereby facilitates reading. (Dillon 1994)
There is conflicting evidence whether reading from computer screens may be slower or less accurate than reading from paper, but no one variable is likely to be responsible for this difference (Stark, Edmonds & Quinn 2007, Larson 2007, Dillon 1994).
A larger percentage of newspaper story text was read online (77%) than in print (62%) (Stark, Edmonds & Quinn 2007).
63% of online readers read their selected stories to completion compared with 40% in print (Stark, Edmonds & Quinn 2007).

Typefaces
Typefaces designed specifically for screen – such as Verdana – can significantly improve legibility and reading text at small sizes (12 point or below).
Verdana is more legible than Georgia and Arial, and in turn Georgia and Arial are more legible than Times New Roman (Sheedy, 2005).
Verdana, which was specifically developed for computers, has the largest lowercase letter heights and the most generous spacing inside and between letters
Typographic enhancements such as lowercase letters that are proportionally tall compared to uppercase letters, stroke widths that aren't too thin, and generous spacing both inside the letter and between letters improve the legibility of a typeface on screen (Larson, 2007).
Typefaces with heavier even strokes, strong joins and diagonals, horizontal curves are more legible on screen (Geraldine Wade in Torre, 2005).

Typesetting
Type size on screen should not be smaller than 11 point for serif fonts or 9 point for sans serif fonts (Dyson, 2002).
Interlinear spacing should not be too tight on screen but depends on type size and line length; longer lines require more space between lines (Dyson 2002).
The optimal line length in print is 55 cpl (characters per line) similar to print (60-80 cpl) but longer line lengths (100 cpl) for screen reading can reduce scrolling time and increase pause time (Dyson 2001).
Text should be displayed in positive presentation format – black characters on a white background because on ergonomic grounds it more successfully rejects reflections from the normal forms of illumination (lighting, windows). (Dillon 1994)
Black text on white background or a closely related combination (shades of grey) should be used because readability advantages of both the contrast ratio of black and white and the convention or familiarity (Hall & Hanna, 2004).
If other colour conventions are used, they should be governed by sufficient contrast as per W3C guidelines http://www.w3.org/TR/AERT#color-contrast

Format
Presenting text electronically is a complex issue – suitable formats for paper are unlikely to transfer simply to screens.
The diversity of texts currently available to readers advocates considering each text in terms of how it is read, why the reader accesses it and the type of information it contains in order to devise an appropriate format.

Screen Technology
The quality of the image presented to the reader of the text on screen is the most crucial factor affecting legibility.
Improving screen resolution two or threefold (to 200ppi or 300ppi) would make typographic enhancements for screen less necessary (Larson, 2007)
The addition of anti-aliasing techniques improves legibility (Dillon 1994 and Dyson 2002).
17 % improvement in word recognition accuracy has been recorded with readers using ClearType (Gugerty, 2004).
Scanning and pin-pointing specific information in a spreadsheet recorded 7% faster with readers using ClearType (Dillon, 2006).
The refresh rate of the screen should be as high as possible, certainly higher than 60 hz. (Dillon 1994).

User Interaction
Navigation issues raise further questions about the presentation of contextual information, and it is clear that more of this information can be visible on a large screen than on a small screen. Hence, work is required on the effects of screen size on the comprehension of extended texts. (Dillon, 2006)
Scrolling frequency and time can increase pause time when reading and may interrupt the flow of reading (Dyson 2001).
The ways in which readers move through (scrolling and paging are two options) or navigate material on screen affect reading from screen but requires research (Dyson 2002).
Reading comprehension (in online newspapers) is aided by alternative story forms such as Q&A's, timelines, sidebars and lists (Stark, Edmonds & Quinn 2007).
Moving elements on screen may influence legibility as reading takes place without eye movements. This method may be useful when space is limited (e.g. on a very small screen), but it does prevent readers from being able to scan or skim material (Dyson 2002).
Screen presentation, alternative document structures and rapid navigational facilities are the most important factors that can aid readers to perform the many other activities involved in text usage (Dillon 1991).

Reader Behaviour
Readers frowned more when reading a poor page layout
Readers prefer symmetrical typefaces and perceive letters and words that aren't symmetrical as ugly. Asymmetrical letterforms degrade the reading experience (Larson & Picard, 2004)
Good quality typography is responsible for greater engagement during reading (Larson & Picard, 2004)

Table 2. 5 Table of Legibility Factors for Screen Typography.

Empirical research, into the factors affecting legibility for onscreen reading, naturally lags behind the ongoing technological advancements in screen technology and reading platforms. Many areas such as reader behavior, interaction and interface design still require significant study and do not easily fit into the empirical methods of scientific research. However, there is consensus amongst leading researchers such as Dillon, Larson and Dyson that areas such as dynamic content, navigation, emotion and pleasure have a significant affect on reading behavior and that they are key research areas for the future.

2.7 Summary of Findings

The main findings from this chapter, in relation to screen media and technologies, are:

- Practitioners of screen typography are currently critically discussing, writing and presenting about the practice online. This is where most of the literature about practice and practice methods can be found.

- Definition and properties of what constitutes a 'screen' (figure 2.6)

- Visual typology of types of screens and screen rendering technologies (figures 2.2, 2.3, 2.4)

- Identification of screen usage contexts and associated audience behavior (figure 2.5)

- List of screen properties or characteristics that may be taken to be consistent for all forms of screens in the context of this research (figure 2.6)

- Identification of typeface characteristics that are most suited for screen use

- Collation of key factors affecting legibility of typography on screen

These findings have informed the subsequent direction of this research, namely the need to focus not on specific technologies, but rather on high-level properties of the screen environment in order to make a sustainable research contribution in a rapidly emergent and changing field. Chapters 3 and 4 will attest to the significance of the findings in this chapter, as the discussion moves from a technology focus, to examine traditional knowledge evident in the current literature (chapter 3), and on emerging knowledge, through a critical review of contemporary practice (chapter 4). The findings from this chapter (2) and the proceeding chapters 3 and 4 combine together to inform the main practical outcomes and contribution of this PhD which are detailed later in chapters 7 and 8.

Chapter 3: Typographic Knowledge

> *There are two essential aspects to the work of the typographer: he must take into account knowledge already acquired and keep his mind receptive to novelty.*
> (Emil Ruder, 1967: 5)

Traditional typographic knowledge is firmly established with a history that spans over five hundred years, starting with the invention of printing and continuing to include present-day digital technologies. For printed typography, there are widely accepted design methods used in conventional practice throughout the world by both educational and commercial design organisations. These design methods, or practical design principles, are well documented in the volume of literature published during the last century on the subject of printed typography. The value of understanding existing knowledge, in particular the practical design principles that govern typography, was critical to this study, in order to ascertain how traditional knowledge could be applied on screen, and what, if any were the modifications and/or extensions required.

A literature review was deemed the most appropriate method to examine existing typographic knowledge. The three main aims of the literature review are as follows:

1.   To identify the most widely accepted and commonly used set of design properties and principles governing contemporary practice in printed typography;
2.   To confirm that the majority of published literature relating to typographic design principles for practice relates from a print perspective;
3.   To demonstrate the deficit of literature addressing screen specific design aspects for typography.

The process of conducting the literature review led to the extensive use of visualisation as a method for uncovering critical relationships and patterns amidst the literature. A major outcome of the literature review is the literature map visualisation, which effectively highlighted the unique nature of Emil Ruder's book Typographie as possessing a timeless quality and providing a considered blend of philosophy and practice. The literature map also highlighted his influence across the field of practice. The literature map and other findings from this literature review significantly influenced the direction of the research to focus on Ruder, and provided the rationale (detailed in chapter 5) for using his methods as a starting point to develop a practice methodology for screen typography. The proposed relevance of Ruder's work to contemporary practice in screen typography formed the basis of a peer-reviewed journal article, *Emil Ruder: A Future for Design Principles in Screen Typography*, in *Design Issues* published by MIT Press in the Winter Issue, 2010 (Kenna, 2010).

The respected quarterly publication, *Eye – the international review of graphic design*, also published the literature map visualisation on its blog website as part of an article *Graphic Design Readings Lists – How should we choose texts to guide students through the info-blizzard?,* published in March 2012 (Rigley, 2012).

3.1 Scoping the Literature Review

The scope of typographic literature relating to practical design principles is considerable, and it was not immediately apparent which material would be of direct relevance to this study. Consequently, visual mapping was used as one of the main methods to sort, sift, and classify the relevant literature.

Through a process of iteratively sketching several concept maps, the main areas of relevance, and key historical milestones in typographic publishing, were identified and then plotted roughly on a timeline (figure 3.1). Early categories included: technology developments, significant publications and practical works, typefaces and foundries, and design principles.
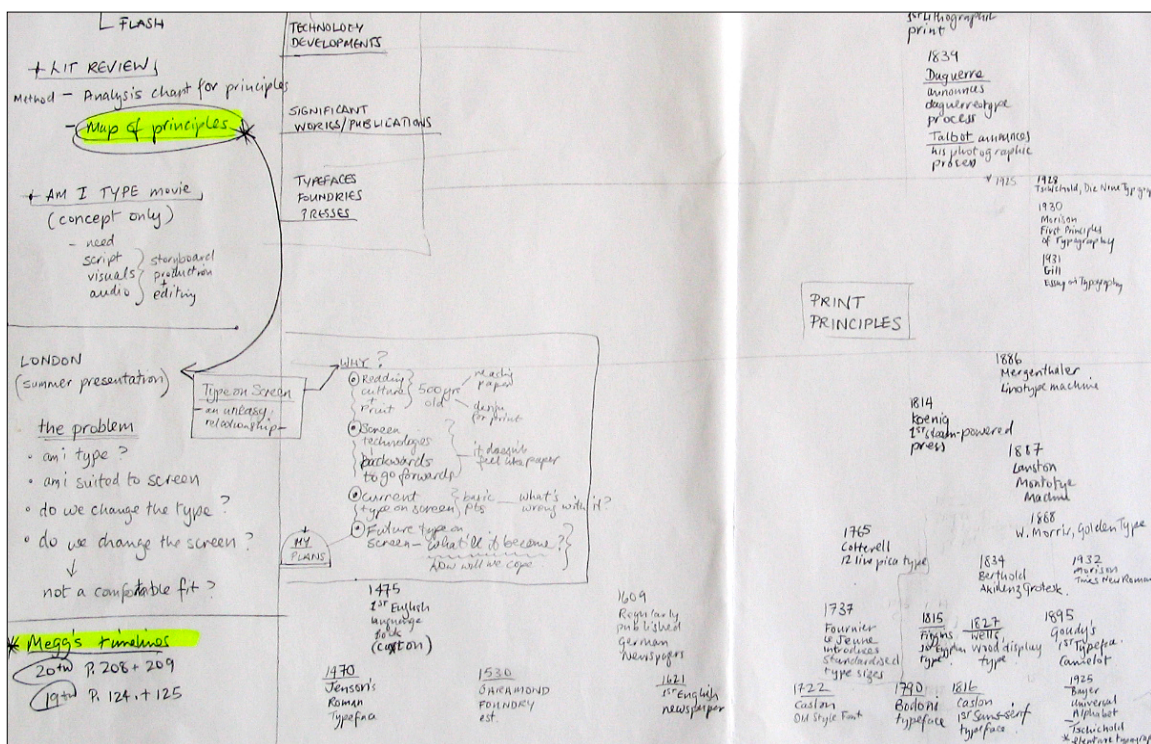
Figure 3.1 Map sketch of main milestones in the history of printed typography.

These areas gradually distilled into three categories: designers; significant publications in design and typography; and approaches to design (schools, manifestos, movements) (figure 3.2).

PhD Thesis: Chapter 3: Typographic Knowledge © Hilary Kenna, 2012.
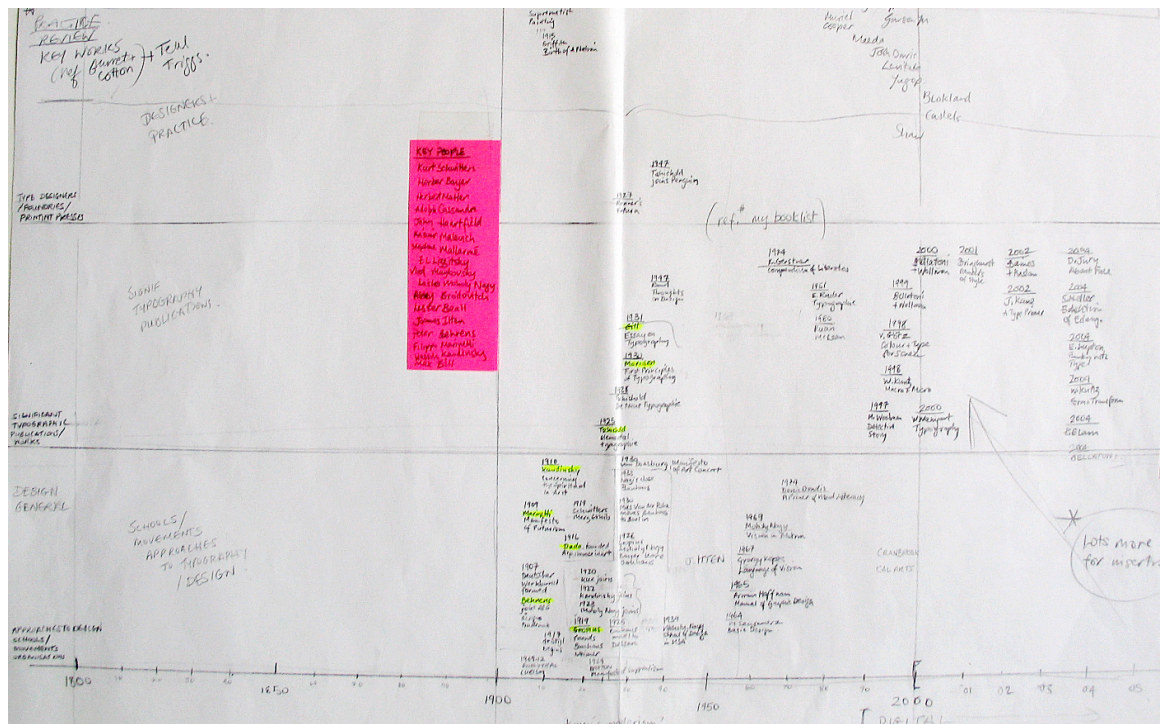
Figure 3.2 Map sketch of key publications about typography from 1900-2005.
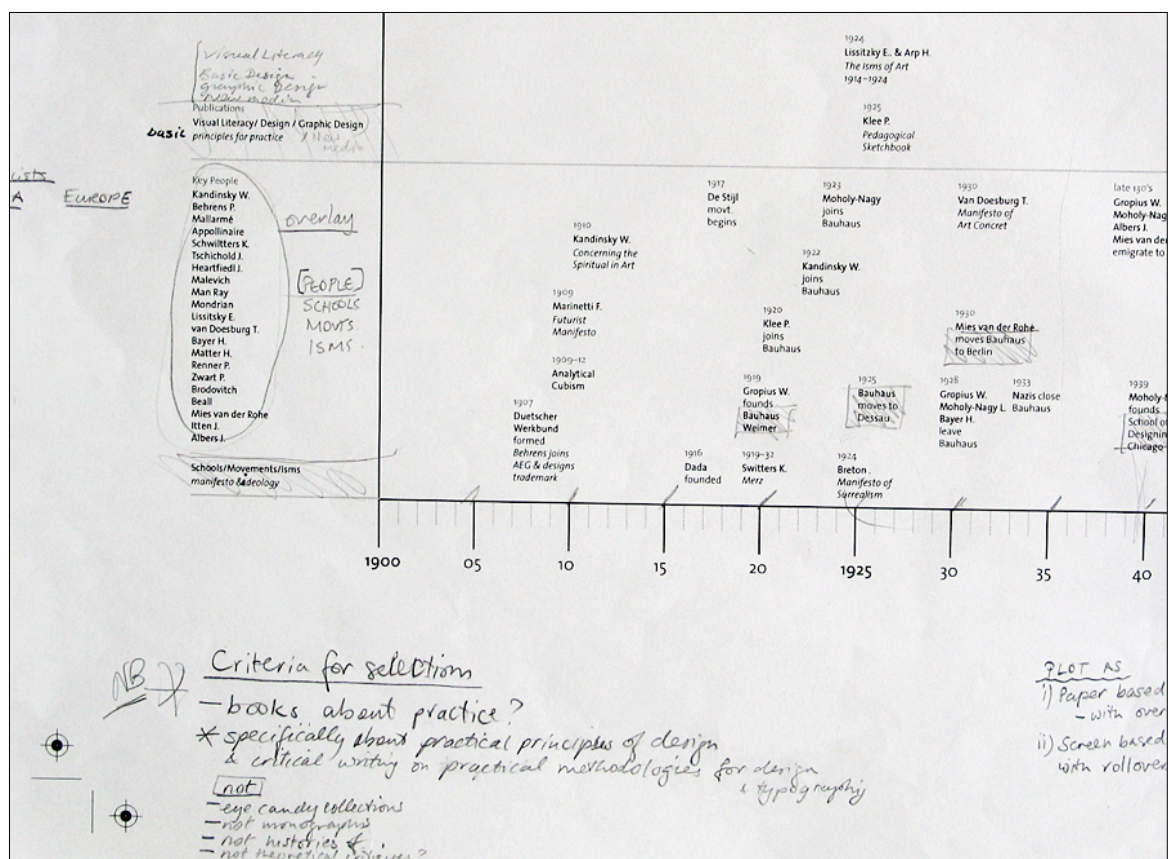
Figure 3.3 Sketch of key publications about typography from 1900-2005.

From the three categories above, further sub-themes were extrapolated to include: typography design principles, general design principles and visual literacy, grids, new media design (motion, web, interactive), theory of design, and legibility (figure 3.3 and 3.4).

Figure 3.4 Sketch of key publications about typography from 1900-2005.

Gradually the literature was divided into two main groups: books relating to methods for practice; and those discussing methods used in examples of practice. Hence two major categories emerged: For Practice (practical manuals) and About Practice (theoretical literature). Finally, based on the mapping process above, each of the two main categories was further broken down into five sub-categories as follows:

For Practice	About Practice
Design Basics	Education and Critical Writing
Typography (general principles)	History
Grid/Layout	By/About Designers
Book Typography	Anthologies of Practice
Screen Design and Typography	Legibility

Table 3.1 Categories of literature on typography practice

With the sub-categories identified, visualisation sketches mapping the literature into these categories were plotted across a timeline (figure 3.5).
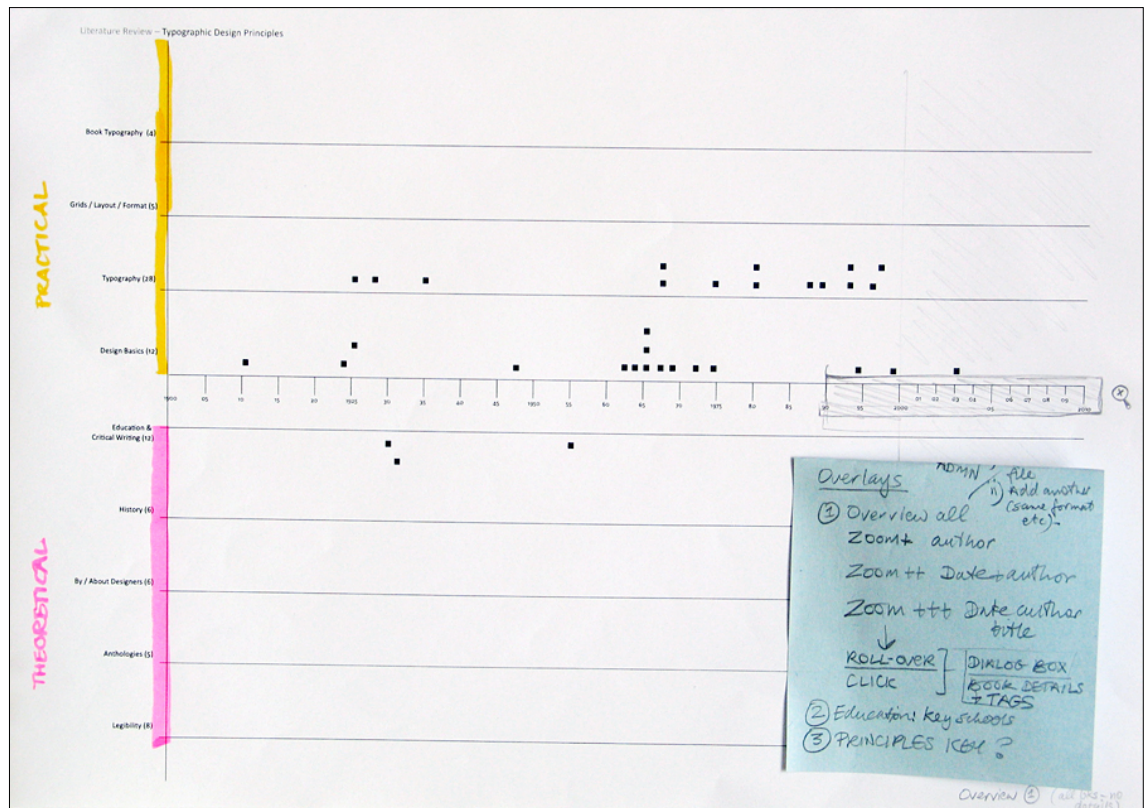
Figure 3.5 Sketches and visual development of categories for literature map.

These visualisations made it possible to see the scope of available literature in relation to the thematic strands of practical knowledge that were identified. These sketches formed the basis of what became the literature map visualisation (figure 3.6 Literature Map), which was designed for paper and screen display.

With a structural framework established in which to sort the literature, it was important to develop criteria for inclusion of the most relevant material to the research study. The sample of traditional literature included in the review was selected on the basis of one or more of the following criteria:

1.   Critical focus on design principles and methods for typographic practice;

2.   Established usage within educational institutions and course curricula;

3.   Peer reviewed or referenced on recommended reading lists by educational and professional design organisations (AIGA, AGI, ISTD etc.), journals (*Visual Communication*, *Visible Language*) trade publications (*Eye*, *Baseline*, *IDEA Magazine*), and online resources (see table 1.5, chapter 1);

4.   Author reputation (as practitioner/educator/critic) and evidence of reference citations in other typography publications and;

5.   Consumer popularity and contemporaneity.

The following material was excluded from the literature map on the basis of low relevancy and a lack of supporting critical text:

- Books relating to general graphic design processes and methods (with the exception of those dedicated to design basics);

- Books about designers without a specialism in typography;

- General anthologies of design;

- Anthologies of typefaces and type design, and;

- Books about technical production and printing methods.

Other relevant material, which was identified, but not incorporated into the map included: print and online versions of journal articles (with the exception of the section on legibility where there are few book publications available); foreign language publications, and technical software manuals or 'how to' books. The list of online resources used throughout the research, and also in the literature review, is shown in chapter 1, table 1.5.

Although much of the latest and newest information for screen typography is available online and in journal literature, this material is more difficult to classify and keep track of using traditional methods. This difficulty was one of the key motives for developing the *type4screen* website and blog (as introduced in chapter 1) as a critical archive and retrieval system for research gathering. Foreign language publications were rejected because of the researcher's inability to read or evaluate them, and 'how to' books relating to software techniques were ruled out on the basis of obsolescence.

Lastly, a number of design and typographic publications were rejected on the basis of having insufficient emphasis on typography or because they didn't address aspects of principles for practice. The selection of books highlighted in the map represents a spread of literature focusing on typographic design principles from a number of different perspectives including: historical, critical, theoretical, instructional, demonstrative or from the researcher's perspective as an educator and professional designer.

Over 200 relevant publications were identified and included from the inception of the literature map in 2005, and new publications have been added each year up to the present, 2012. There is also an accompanying bibliography, which provides the details of each publication on the map. The literature map was used as a continual reference point throughout the writing of the literature review because it presents a macro view of all the relevant literature for this study on typographic design principles.

The literature map's structure of two groups and ten sub-categories made it easier to uncover critical relationships between publications about history, theory or practice, their authors, publication dates and countries of origin. It is difficult to see how purely written methods would have uncovered these critical patterns so readily. A critical discussion of discoveries made with the aid of the literature map will be discussed later in this chapter.

Literature Map 1900–2012 Typographic Design Principles

FOR PRACTICE
- Screen Design & Typography (15)
- Book Typography (9)
- Grid/Layout (13)
- Typography (56)
- Design Basics (21)

ABOUT PRACTICE
- Education & Critical Writing (27)
- History (11)
- By/About Designers (24)
- Anthologies of Practice (12)
- Legibility (22)

© Hilary Kenna, 2006–2012.
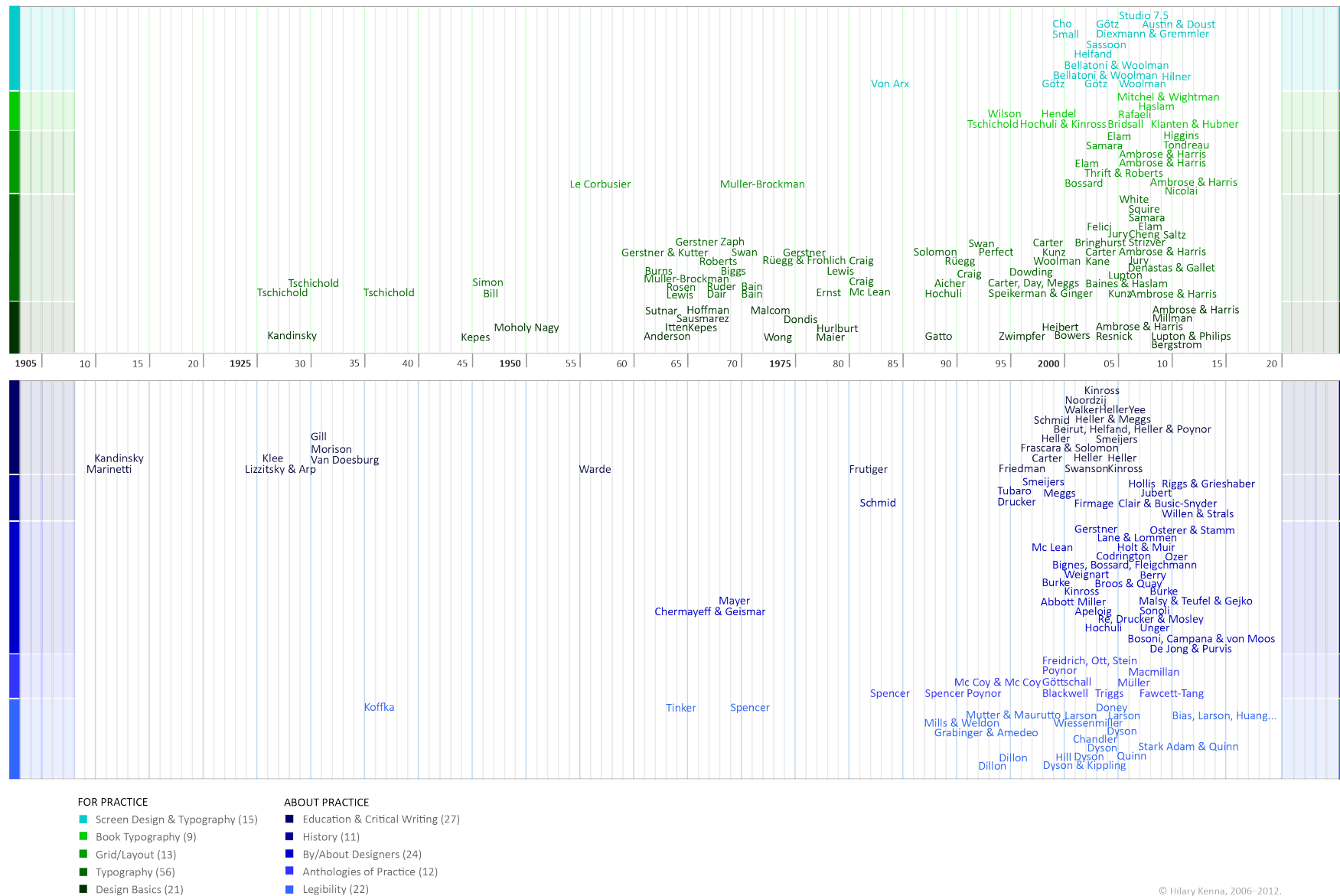
Figure 3.6 Literature Map

3.2 Nature of Typographic Knowledge

Before a discussion of the key practical methods identified in the literature, it is worth noting the nature of how typographic knowledge is acquired, documented and passed on to others. It helps to explain the nature and development of the published literature on typographic design principles.

Typography and graphic design is a relatively immature discipline when compared with more established fields within the arts and humanities such as Painting, Sculpture, Philosophy, History or Literature. Although the history of visual communication could begin with the origins of early writing systems, graphic design as we know it today did not become an area of specialisation within the arts, or a recognised profession in its own right, until midway through the twentieth century (Hollis, 1994). The origins of modern typography and graphic design began with the invention of printing and the craft of typesetting over five hundreds years ago. Since then, it developed from the 'graphic art' of the late nineteenth century, to the avant-garde design movement of the early twentieth century; and through various stages of 'commercial art' and 'modernist design' in the mid twentieth century, to the post-digital era that exists today. Over this period, knowledge of the discipline was (and continues to be) developed and passed on to others through primarily practice-based and applied design activities. Typographic knowledge can be described as tacit knowledge that is learnt by doing. Traditionally, typography was learnt in a workshop setting in a master-apprentice relationship that took six or seven years (Kinross 2004). The apprentice, under careful instruction and supervision, learnt to set metal text by hand through meticulous application. A clear understanding of every detail relating to the formalities of spacing letters, words and lines of text was learnt very gradually through this slow, often painstaking practical process.

Many early courses in design and typography were founded on this 'atelier' (studio) model, which owes its origins to the influence of the Arts and Crafts movement. The practice of setting metal type is still retained as a valuable fundamental learning experience in some courses today (Irwin, in Heller 2004). Renowned typographers such as Wolfgang Weingart and Helmut Schmid positively acknowledge the invaluable bedrock of tacit knowledge that they learnt through this experience and lament the fact that it is unobtainable for many contemporary learning environments (Weingart, 2000). It is worth highlighting that the tacit knowledge learnt through the practice of making typography is also the reason why it is difficult to write about it academically, to convert practical know-how into formal knowledge that can be passed onto others via the written word. Much of the detail and nuance of typographic design practice is learnt through the act of doing it, by setting type and by manipulating its position, size, weight, and spacing. There are many examples of typographic writing that focus on the practical endeavour of typography (see figure 3.6 literature map), providing comprehensive illustrations of different applied methods and techniques. However, the majority of these books act as a support reference for the reader in the practical process of 'doing' what they document. The 'learning by doing method' is especially relevant to acquiring typographic knowledge (Doorst, 2003).

Academic research in the field of typography is still relatively new and the mainstay of written knowledge has been historically and technically based rather than theoretically driven. The critic and author Rick Poynor points out that compared to art history or film history there is a severe lack of 'scholarly book publishing' on graphic design history that critically interprets past traditions and their contemporary significance with regard to advancing the discipline as a 'humanity' in its own right (Poynor, 2005). Renowned typographer, historian and teacher Robin Kinross agrees with Poynor, suggesting that typographic history is the 'vaguest' and 'least substantial' category of design literature. In his book, *Modern Typography, a critical history* (2004), Kinross explains how the history of typography has been largely documented by practicing designers, and that while it represents the only type of literature to acknowledge the aesthetic factor in printing, it has a tendency to 'do little else but view'. Kinross goes as far as to suggest that this literature is 'crippled by an absence of historical skills and superficial notions of design' (Kinross, 2004, 17). Kinross believes that in order to gain the critical insight required, the literature must incorporate insights from other kinds of history and enquiry outside typography, in architecture and design, and in historical and theoretical discussion more generally.

Development of Practical Principles for Designing Typography

In his book, *Modern typography: an essay in critical history* (1992 & 2004), typographer and author Robin Kinross attributes the title of 'the first manual' of typography to Joseph Moxton's book, *Mechanick exercises: or the doctrine of handy-works applied to the art of printing* (1683-84). Kinross traces the first separation of printing and typography, and the subsequent first definition of a typographer to this seventeenth century book, in which Moxton describes:

> *...such a one, who by his own judgement, from solid reasoning within himself, can either perform, or direct others to perform from the beginning to the end, all the handy-works and physical operations relating to typographie* (Moxton, 1683-4, pp.11-12)

From the seventeenth century to present day, there is a long history of the development of typography as a practical discipline distinct from printing. Part of this history includes the complexities concerning the move from mechanised to digital methods of reproduction and its impact on typographic practice. A detailed account of this history is outside the remit of this study so what follows is a discussion of how the main milestones in this development impacted on typographic knowledge. Of key concern is how design principles and methodologies that govern contemporary practice in typography have evolved and become commonly accepted over time.

1900-1930's

The historical point of departure selected for the literature review was the modernist period in Europe beginning early in the twentieth century when there was a flourishing of academic and theoretical debate and publishing about design and typography. It also coincided with the first

'screen' technologies that emerged during this period through the birth of cinema and technological advances in photography.

The early half of the twentieth century signalled the maturing of typography and graphic design into a distinct discipline of study with formal methodologies and principles for practice written down in various treatises, manifestos, essays, pamphlets and books that were published during this period. Some of the most noteworthy contributions include publications by key figures such as:

- Wassily Kandinsky, Laslo Moholy Nagy, Johannes Itten, Paul Klee, Herbert Bayer, amongst other artists and teaching staff from the Bauhaus, Germany;

- Avant garde artists and designers such as El Lissitzky (Russia), Fillipo Marinetti (Italy), and Guilluame Appollinaire (France);

- Typographers such as Jan Tschichold (Germany), Stanley Morrison (UK), Eric Gill (UK), Max Bill (Switzerland) and a typographic researcher Beatrice Warde (USA);

Robin Kinross suggests that during this period 'modern typography' developed along two lines; traditional 'book' typography, which was most clearly expressed by Stanley Morison, and unconventional typographic work that was termed 'modernist'. The latter was often viewed as:

> *an incursion of artists blundering into the quiet preserves of book printing and there violating the wisdom of tradition and convention* (Kinross, 2004, p.18).

These two approaches are significant because they promoted two different approaches that influenced the development of practical principles for typography. On one hand, the likes of Morison and Warde fostered a classical typography (figure 3.7) and a functional rule-based approach focused on communication and legibility, while on the other hand avant-garde artists such as Marinetti, and Lizzitsky supported an expressive approach that is often experimental, and mainly concerned with visual form (figure 3.8). Others, such as Jan Tschichold, combined aspects of both approaches (figure 3.9).

Figure 3.7 Title page from *The Fleuron* journal (1923) (image from *www.liveauctioneers.com*) and *Poliphilus* typeface specimen (1923) (image from *http://theredlist.fr*).

Figure 3.8 *Zang Tumb Tumb* by Filippo Marinetti (1912).

Figure 3.9 Film Posters by Jan Tschichold.

Morison's seminal publication *First Principles of Typography* (1930) was one of the earliest publications to set out rules for the practice of printed typography (figure 3.10).

Figure 3.10 *First Principles of Typography* by Stanley Morison (1930), (image from *www.thinkingform.com).*

He expressed the resolute view, that typographic practice was 'essentially utilitarian and only accidentally aesthetic' and that unbending 'obedience to convention' was needed for 'arranging the letter, distributing the space, and controlling the type as to aid to the maximum the reader's comprehension of the text' (Morison, 1930).

Some of Morison's rules include:

- choosing a typeface that readers wouldn't notice, and that is widely 'accepted by the community' such as Caslon or Jenson,

- setting the type with a line length containing not more than 10-12 words and creating line spacing based on the width of the line and size of the type

- composing the text on the page in rectangle (not square) setting with generous margins around it for thumbs and fingers holding the book.

Morison also explains at length the range of factors at the printers control and provides a detailed list of exactly how each bibliographic convention (title page, prelims, table of contents, chapter headings, running headers etc.) of a book's design should be specified. Even though Morison's rules seem creatively stifling, they became accepted good practice in traditional typography and continued to be built upon by other practitioners who followed him. One such figure was Beatrice Warde, who, although not a designer, published a seminal treatise on typography in 1955 called *The Crystal Goblet*, which she delivered first as a speech called *Printing Should Be Invisible*, in 1930 at the British Typographer's Guild at the St. Bride Institute, London (Jacob (ed.) & Warde 1955). Warde emphasised the primary function of typography to be clarity and its visual form secondary in service only to producing clarity for the reader. Her perspective is modernist with respect to the notion that typographic form follows its function, but she was opposed to a visual form of typography that drew attention to itself.

On the pioneering side of 'modern typography', there were radical as well as tempered calls for change. Marinetti (figure 3.11), and other Futurists and later Dadaists, sought to break the rules and to challenge the reader, provoking them from a slumber of traditional obedience to embrace all things modern such as speed and technology (Bartram, 2006).

Figure 3.11 *Les Mots en Liberté Futuristes* by Filippo Marinetti (1919).

They introduced new concepts such as sound and dynamic layouts in typography where the visual expression of the typography might reflect the sound of the spoken word or the movement and allude to the speed of technological progress. In 1923, El Lissitzky published the statement *Topographie der Typographie* in Kurt Schwitter's publication *Merz*, which set out some of the leading ideas about the new typography where every convention was open to question (figure 3.12).

Figure 3.12 Merz publication designed by Kurt Schwitters (1924).

In 1928, Jan Tschichold published *The New Typography* and declared a new set of principles to replace the traditional symmetrical layouts appropriate for the old age of 'slow reading' (private engagement with the book). The 'principles for the modern age' were designed to grab the attention of the reader and lead them through the message, step by step. They included; dynamic asymmetrical compositions, a clear hierarchy of type sizes in a sans-serif typeface, the economy of block type against clean white background and the energy of simple geometric elements (Manovich, 1999).

Figure 3.13 Postcard (1919) and poster for *Kunsthalle*, Basle (1937) by Jan Tschichold.

The practical output and writing from the likes of Marinetti and Tschichold, proposed a move away from the traditional compositional arrangements, which emphasised the 'form' of the typography. In Marinetti's case the composition was wild and free, aggressive and expressive, while Tschichold's was ordered and measured in carefully contrasted asymmetry. A key concept of both

PhD Thesis: Chapter 3: Typographic Knowledge © Hilary Kenna, 2012.

however was the concept of objectivity and neutrality – that the visual form of typography would present the message directly to the viewer through the means controlled by the designer. It dismissed the possibility of creative interpretation on the side of the viewer. The design was calculated to reveal its message directly through its visual form, not to hide it or be left open to interpretation.

Too numerous to discuss here, there are many other important figures such as Theo von Doesburg, Kurt Schwitters, H.N. Werkman and Piet Zwart amongst others (figure 3.14), who produced outstanding work for the time noteworthy for its dynamic composition and non-conventional setting of typographic form.

Figure 3.14 *Scarecrow Fairy Tale* (1925) by Kurt Schwitters and Theo van Doesburg**,** *Alianz Kunsthaus Zurich* poster by Max Bill (1947), *NFK Catalogue* spread by Piet Zwart (1928).

Their work practically manifested the ideas and principles of the new typography put forward by Lizzitsky, Tschichold, Bill and others. The early principles of the new typography may be summarised as follows:

- rejection of all things traditional: serif or ornamental typefaces, centred type setting, symmetrical layout and composition;

- a rational design approach which produced objective visual forms that directly communicated the intended message to the reader;

- use of sans serif typefaces that had universal appeal (Tschichold 1928);

- asymmetric composition that produced dynamically arresting visuals which captured the readers attention;

- overall visual form of the design should reflect the modern spirit of the time.

The theoretical and practical output from the likes of Morison, Tschichold and avant garde artists such as Marinetti and El Lissitzky, laid the foundation for what would later develop into the formal establishment of accepted models for 'modern' typographic design practice. However, Morison, Tschichold and Marinetti also typify the significant differences in theory, practice and approach that emerged in the early stages of this development. Their work demonstrates three strands of emphasis: functional, formal and experimental, which are often conflicting but mutually

informative. These three were nonetheless developed and integrated into these emerging new models of practice.

1940-1960's

The work of the first three decades of the twentieth century continued to form a critical basis upon which subsequent publications about the practice of design and typography were developed and refined. In both Europe and America, amongst the most notable work was that of Gyorgy Kepes, Armin Hoffman, Emil Ruder, Josef Muller–Brockman and Karl Gerstner, to name but a few.

Kepes' book, *Language of Vision* (1944), presented a seminal move toward developing a universal language of design based on manipulating geometric forms and their properties based on rules from gestalt psychology that govern our visual perception (figure 3.15). Key designers such as Armin Hoffman, Emil Ruder, and others incorporated these concepts into the teaching practice of design basics and recognised them as prerequisite knowledge for learning typography.

Figure 3.15 Studies of visual form from *Language of Vision* (1944) by Gyory Kepes.

From the 1940's to the 1960's, the leading model of modernist typography emerged from Switzerland and became simply known as 'Swiss typography'. Later as its influence spread, it was referred to as the 'International style'. The key instigators of this movement were Emil Ruder, a designer and teacher at the Basel School of Design and others designers such as Max Bill, Karl Gerstner, Markus Kutter, Richard Lohse and Josef Müller-Brockman (figure 3.16).

Figure 3.16 Geigy poster by Max Bill (1952), Allianz Helmhaus Zürich poster by Richard Lohse (1954), Kunsthauses Zurich poster by Josef Müller-Brockman (1953).

Jan Tchichold's 1928 book places him as one of the earliest major contributors to this style, but he later denounced its ideas including asymmetrical typography (which he had begun to associate with Fascism in the early 1940's) and returned to classic symmetrical typography when he moved to work at Penguin books in London.

Swiss typography evolved in a neutral environment uninterrupted by the social and economic upheaval experienced by its surrounding countries that were recovering from the Second World War. During the 1930's modernist approaches had already gained a firm foothold in Switzerland, especially in the larger field of graphic art and poster design, where the practice of using simplified images, integrating of text and image, and the use of photographs and photomontage were customary (Kinross, 2004). Other aspects of Swiss culture, such as direct democracy, strict law abidance and a general social conscience with regard to the truth and usefulness of public information in all its forms (including advertising), also contributed to the circumstances in which this new typography transpired. Additionally, Switzerland was a tri-lingual country so there was a need for typographic methods to address the problem of producing material in English, French and German. Most importantly of all was the strong craft tradition that existed in Switzerland, which was carried over into industrial production and combined with advanced technology in the printing industry. All of these factors combined to create the context in which Swiss typography emerged.

A number of key publications chart the path of development of Swiss typography to the International style and the establishment of modernist typographic design principles. First was Max Bill's publication *Über Typographie* (1946), which set out a number of principles for the new typography and around which a number of designers started to follow. The magazine *Neue Grafik (1958-65)* and the book *Die neue Grafik* (1959) by Karl Gerstner and Markus Kutter also spread awareness of Swiss typography to an international readership (figure 3.17).

Figure 3.17 *Neue Grafik* magazine (1958-65) by Karl Gerstner and Markus Kutter

Emil Ruder was a regular contributor to *Neue Grafik* and to another magazine *Typographische Mönasblatter.* Between 1959 and 1965 he published a series of articles about the underlying principles of his teaching and this new movement, which he called 'the typography of order' (Schmid, 1981). However, in 1961, Josef Müller-Brockman published a book, *The graphic artist and*

his design problems, which became a primary publication in the international dissemination of Swiss typography and its methods (figure 3.18).

Figure 3.18 The Graphic Artist and his Design Problems by Josef Müller-Brockman (1961) (image from *www.designers-books.com*).

Müller-Brockman detailed at length the core principles of this new 'graphic art', including:

- objective presentation through the elimination of decorative and expressive effects;

- unadorned typography that clearly conveys the message to be communicated;

- use of a grid for ordering the information and graphic elements;

- restriction of type sizes and typefaces (san serif, because it was a neutral, modern 'expression of our age' (Bill, 1946));

- unjustified text setting;

- use of photography instead of illustration.

In his recent book, *Swiss Graphic Design: The Origins and Growth of an International Style 1920-196*5, Richard Hollis credits Müller-Brockman and Theo Balmer as having the prime influence on the development of Swiss graphic design. However, Kenneth Heibert (former Yale design professor and colleague of Hollis), who was a student of Hoffman and Ruder at Basel during the 1950's, strongly argues that their (Emil Ruder and Armin Hoffman) influence was of much greater significance and points to a number of inaccuracies in Hollis' chronology of development (Heibert, 2007). He claims that Müller-Brockman's own practice changed significantly towards the 'modernist' style for which he remains famous (figure 3.19), but only after hiring graduates of the Basel school under Armin Hofmann in 1955. According to Heibert, this means that Hofmann and Ruder pre-date Müller-Brockman's mature style instead of being placed by Hollis as a separate and later development (Hollis, 2007, p.214). Although Müller-Brockman's book was published before Hoffman's and Ruder's individual treatises on design basics and typography respectively, it is evident from their earlier teaching and writing (during the period 1944-67) that they were key figures in the development of the main concepts and methods that underpin modernist Swiss typography.

Figure 3.19 Posters by Josef Müller-Brockman.

Emil Ruder taught at Basel from 1942 until his death in 1970, when he was director of the school. He did not publish *Typographie: a manual for design* (figure 3.20), the now famous book that was to summarise his approach, philosophy and methods, until 1967, by which time the 'International style' and its major proponents such as Müller-Brockman were well known. However, Ruder's book remains a seminal publication that sets out the modernist methodology and principles for the practice of typography, upon which the Basel course was founded.

Figure 3.20 Cover and spreads from Emil Ruder's book, *Typographie: a manual for design* (1967)

Ruder's book is organised into nineteen thematic essays such as 'proportions', 'contrast', 'variations', 'rhythm' etc., each signifying a key consideration for practice (figure 3.20). Accompanying each essay is a comprehensive range of demonstrative visual examples. The book is a dense mix of historical insight, Ruder's personal philosophy of design and textbook like instruction. Many of the principles that Müller-Brockman put forward are also reiterated by Ruder, but he proposes a holistic practical approach that encourages critical reflection, comparative analysis (via multiple iterations) and experimentation. While Ruder is viewed as one of the staunchest advocates of Swiss typography, his writing reflects a more humanistic perspective, compared to the constructivist direction of Müller Brockman (Heibert, 2007). Typographer Helmult Schmid also suggests that there is a rhythmic refinement in Ruder's method of practice that is lacking in the more dogmatic examples of Swiss typography.

The legacy of Ruder's teaching and practice is highly significant to the development of later publications on typography practice. Katherine McCoy, a radical American design educator and designer, traced this path of influence from Basel on American design education in a paper presented at the AIGA Educator's conference *Schools of Thought 2* in 2005 and again at a lecture at Utah Valley University in March 2012. She uncovered a web of connections between graduates from Basel teaching in US design schools and the prevalence of modernist methodology and approach in those same schools from 1966-1971 (McCoy, 2005). The general influence of modernism on typography is reflected in the surge of publications about practical principles and design methodology that emerged in the 1960's which is evident on the literature map.

1970-1990's

From 1970 to 1980, there appears to have been a lull in development with regard to new typographic methodologies. Most of the literature, published during this decade, appears to reiterate the main methodologies derived in earlier decades, but with more focus on functional, pragmatic aspects of historical production and diminished emphasis on aesthetic aspects. Some books, such as Craig (1971) Lewis (1978) and McLean (1980) present typographic principles in relation to historical knowledge of typeface design, or pragmatic concerns such as legibility and print production (figure 3.21).

Figure 3.21 Pages from *Designing with Type* (5th edition, 2006) by James Craig *Typography: Design and Practice* (1978) by John Lewis .

There is scant critical insight about the application of design principles from an aesthetic perspective. To put it plainly, it is possible to functionally apply typographic principles put forward by these publications without consideration for the visual impact or aesthetic quality of the design outcome.

In the 1980's radical changes began to happen in the practice of typography and design. Too broad to detail here, two main factors will be discussed:

• a growing dissatisfaction with the constraints of modernist design and typograpy and;

• the introduction and widespread use of digital technology in design and production.

Katherine McCoy and her students at the Cranbrook Academy of Art in Detroit were central agitators for change. In the sixties, McCoy worked on large corporate design and identity projects in companies such as Unimark, Chrysler Corporation and Designers and Partners. Although she was an industrial design graduate, she was exposed to the Swiss method of design and typography during this period and became an avid practitioner. Together with her husband, Michael, they took over the Chair of Design at Cranbrook in 1971 and began to revolutionise the originally renowned design programme that was going through a slump. Initially Katherine McCoy combined the 'objective' Swiss approach to typography that she had maintained in professional practice, with an interest in the social and cultural activism that was in the air in the late '60s. Gradually, however, McCoy encouraged students to create more high-level experimental work and to work speculatively, beyond the professional model (Wild, 1999).

By the late '70s, the Cranbrook course moved into a different, very influential phase. McCoy began to alter the introductory typography projects to allow a semiotic interpretation to begin to drive the outcomes, and she allowed the students to depart from the stricter Modernist vocabulary of previous years, to include stylistic elements that had previously been underused by Modernist typographers, such as historical or vernacular type forms and images (Wild 1999). She also encouraged students to explore theoretical ideas about design and communication through their practice. The practical output of students at Cranbrook during the 1980's produced radical visual work that departed from traditional norms in design communication. Layered typography and visuals in a 'high-octane' mix were composed without regard for conventional rules of legibility or the audience's ability to understand the message. Cranbrook quickly gained a reputation for producing highly creative visual work where interpretation of theory (often literary and linguistic theory) and self-expression took precedent without regard to the conventional purpose of graphic design. In 1990, the McCoys, together with their students produced the book *Cranbrook Design: The New Discourse* (figure 3.22), which documented the work that had been created over the last decade.

Figure 3.22 Cover and page from *Cranbrook Design: The New Discourse* (1990) and poster for Cranbrook Design Program (1989) designed by Katerine McCoy.

This book, coupled with McCoy's writing in various design publications and involvement in professional organisations, ensured there was widespread recognition of the 'new discourse' and elevated the school's international reputation. Cranbrook, is regarded by many design critics and historians (Poynor 1991, Heller 1994, Meggs 1998) as one of the major influences on the post-modern era and style of typography. Yet it is difficult to ascertain whether or not Cranbrook actually contributed new typographic design principles for practice. Certainly, it promoted an anti-modernist approach that rejected existing knowledge and principles for good design and typography. Cranbrook's contribution to typographic methods can be summarised as follows:

- Rejection of modernist principles – type is not restricted by any rules regarding size, colour or orientation, alignment or setting;

- A variety of typefaces can be used and mixed together in a variety of styles and weights;

- Typography should express and interpret the meaning of the text in its visual form regardless of legibility concerns;

- Typographic design is not objective – it encourages subjective interpretation by the reader;

- Typography can be image-based and subjected to a multitude of visual interventions such as layering and distortion;

- Experimentation and serendipity are important drivers of the design process rather than rational and systematic methods.

Across the design spectrum in Europe and America, the move away from traditional principles and the modernist approach to typography and design continued during the 1980's and nineties. In the US, publications such as Emigré (produced by Rudy Vanderlans and Zusanna Licko) provided a platform for disseminating new and radical ideas as well as stimulating (often heated) debate about the merits of the new wave of typography (Emigré 30, *Fallout*, 1994, figure 3.23).

Figure 3.23 *Émigré #30 fallout*, cover and spread, 1994.

Leading designers and critics regularly wrote for the magazine and often previously little known or upcoming innovative designers and design companies were featured. Some of these included

Jeffrey Keedy and Ed Fella (Cranbrook graduates), Designer's Republic (UK company), Jonathan Barnbrook (UK) and David Carson (USA) (figure 3.24).

Figure 3.24 Page in *Émigré #29* by The Designer's Republic (1993), poster for Detroit Focus Gallery (1987) by Ed Fella, application of *Bastard* typeface by Jonathan Barnbrook (1990), page from *End of Print* by David Carson (1995).

In Switzerland, even at Basel, the dissent from tradition continued and a new order of Swiss typography became famous through the work of former graduate turned teacher there, Wolfgang Weingart. Weignart was a student of Ruder's and Hoffman's and was later hired by them to teach typography and design after Ruder at Basel in 1968.

Shortly after he began teaching, Weingart began an intensive period of experimental investigation in his own practice, but he continued using systematic methodologies associated with the modernist approach. However, he purposefully broke traditional rules through experimentation and began to layer and bend lines of type, and to use photolithography and dot screens to create layered images (figure 3.25).

Figure 3.25 *Typographische Mönasblatter* covers (1972 & 1976)*, Kunsthalle Basel Kunstkredit (*1977) poster*.

In parallel to his experimental practice, he initially continued to teach in the traditional Swiss method, until he gradually began to extend the typographic exercises to explore more radical arrangements and forms. In 1972, he wrote a now famous essay, *How can one make Swiss typography?* as accompanying lecture notes to a tour of the US design schools and universities where his work received wide acclaim. Weingart, like McCoy, was initially a staunch advocate of the

Swiss modernist tradition, but he too began to adapt it to his own particular interests. Weingart's work began to explore the 'semantic and syntactic' possibilities of typography while still maintaining high regard for the formal qualities. Weingart felt that 'high stimulus' was missing in the rational work of his predecessors, as he claimed 'What good is readability when nothing in the text attracts one to even read it?' (Weingart, 1972). Despite this however, Weingart also advocated that a thorough understanding of the basic rules must be achieved first in order to provide a solid foundation for exploratory work. Weingart's own practice, his teaching and writing, ensured that a new form of the Swiss tradition extended into the post-modern era of typography that had emerged in the eighties and nineties (figure 3.26). Certainly his influence appeared to be widespread through the wave of work produced during the early nineties that seemed to ape the visual style of Weingart's typography. Weingart publicly acknowledged his displeasure about his work being copied stylistically (Weingart, 1972), rather than the ideas and methodologies behind which the work was created.

In 2000, Weingart published a comprehensive book about his life's work in typography called *My Way to Typography*. However, the book was not a practical manual setting out his teaching methods in the way his predecessors Ruder and Hoffman did, but rather a personal account of his own practice. It is clear from Weingart's book that while he continued to use the systematic approach learnt at Basel, he puts greater emphasis on generative and iterative experimentation in his practical methods. Weingart's article from 1972, still remains the most explicit publication of his approach as transferrable knowledge, in the form of a methodology per se, that others can use. Even though Weingart's book presents a more contemporary treatise, it appears that Ruder's and Hoffman's are more widely cited in contemporary publications about typographic design principles based on examining at the index of the most popular texts (used in teaching are listed in ISTD Research Report: *Typographic Specification – what graduating students should know*, (Doney, 2003)). However, there still remains an aura of awe surrounding Weingart's teaching, and perhaps a true understanding of his methods can only be gained through the tacit knowledge learnt in his classroom.

In 1984, two graduates of Basel and former students of Weingart, Hamish Muir and Simon Johnston, together with another designer Mark Holt, set up a design studio called 8vo in the UK. Heavily influenced by design developments in Europe and America, their aim was to make design work where 'type and typography were central to the idea, where type would be the image' (Encinas, 2007). They began to publish a journal, *Octavo* (1984-1998), about their approach to practice and invited other well-known modernist designers, such as Wim Crouwel to contribute articles. *Octavo* received widespread international acclaim, akin to Weingart, but much of the response centred around aping the visual style, rather than understanding the conceptual background driving the work.

Figure 3.26 Spreads from *Octavo*, issue 5 (1988) and issue 7 (1990).

The late 1980's and first half of the 1990's continued to see a rejection of traditional typographic principles as digital technologies enabled a wide range of experimentation with type and imagery in ways not possible before. Again, too numerous to discuss in detail, many practitioners stand out for their particular design work. Among them, are Neville Brody (UK), David Carson (US), Ed Fella (US), Tomato (UK), Max Kinsman (Netherlands), Phil Baines (UK), April Greiman (US), etc. While some of these designers published anthologies (Wozencroft, 1988 & 1994), (Blackwell & Carson, 1995) of their work or books as practical artifacts (Tomato, 1999), (Fuel, 1997), there is little evidence of their critical or theoretical contribution to typographic literature about practice methodologies for wider use.

Authors and critics outside of the profession, such as Rick Poynor contributed the first critical review of the decade's work. Poynor called it the 'next wave' of typography, in an anthology documenting a range of experimental typography made during this period (Poynor, 1991). It is hard to pinpoint whether this era of design has yet contributed new design principles to the practice of typography or whether it was more a stylistic release from the constraints of modernism enabled by new technologies. But by the late 1990's, this approach had already begun to diminish and a slow return to simpler more restrained typography began to emerge once more. This may have happened because it seemed that every possible visual contortion had been exhausted or because both designers and audiences were growing tired of the visual overload and poor legibility of post-modern typography. Additionally, the Internet had taken a strong foothold as a method of mass media consumption and amidst this information overload it was getting harder to distinguish one's message. There was a renewed sense that the skills of designers were needed to sort, sift, organise and present accessible information in ways that 'people could understand, enjoy and most importantly use' (Kunz, 1998).

1998-2012

By the end of the 1990's and early into the millennium, a number of books that re-examined traditional principles of typography practice began to emerge, including those by Willi Kunz (1998), Robert Bringhurst (2001), John Kane (2002), James Felici (2002), Phil Baines and Andrew Haslam (2004), Ellen Lupton (2004) and David Jury (2004).

Figure 3.27 Book covers as detailed above.

These books present traditional typographic principles in a modern context and for the most part include a comprehensive rationale as to why 'principles' are important in a 'world that is drowning in information reeling with distraction' (Kunz, 1998). There is also a shift in emphasis from the more pragmatic publications of the eighties to a more holistic approach to typographic design that incorporates formal, functional and communication concerns. Robert Bringhurst, a Canadian poet, typographer and book designer, begins his treatise with the claim that 'typography exists to honour content' (Bringhurst, 2001). An expression of conservatism and emphasis on past values are omnipresent in this wave of publishing, evident in the title of David Jury's book, *About Face: Reviving the Rules of Typography* (2004).

Renewed interest in Modernism

The renewed interest in traditional principles happened in parallel with a renewed interest in modernist design in general (Crowley, 2006). This is evident in the increased volume of publications on typographic design practice that extol modernist principles (Kunz, 1998 & 2002), (Lupton, 2004), (Denastas & Gallet, 2006), (Samara, 2006) and in monographs about modernist designers such Jan Tschichold (McLean, 1997), Paul Renner (Burke, 1998), Max Bill (Bignens, Bossard & Flieschmann, 1999), Wim Crouwel (Broos & Quay, 2003), Max Huber (Bosoni, Campana & von Moos, 2006), Josef Müller Brockman (Purcell, 2006), Karl Gerstner (Gerstner, 2006) and many others. The literature map renders this development very apparent.

In 2005, Wolfgang Weingart was instrumental in re-instating the *Basics in Design and Typography* course as a private summer programme. It was originally part of the world renowned Advanced Class of Graphic Design (1968-1999) that was built on the firm conviction that an intensive study of design principles' were necessary in order to solve complex design problems. The current course website acknowledges that the interest in 'basic design-oriented studies' is higher than ever. A contemporary of Weingart at Basel, Helmut Schmid has also been involved in a number of

contemporary publications celebrating the practice methodologies taught at Basel (Malsy, Teufel & Gejko, 2007), (Schmid, 1997).

However, this new literature also generally acknowledges that the restrictive nature of modernist dogma was rejected by a generation of designers craving creative expression. There appears to be an appetite for new models of typographic practice rooted in tradition but which are more open and flexible to change, in line with a contemporary context. Robert Bringhurst suggests that 'there are always exceptions, always excuses for stunts and surprises', that will help to 'reveal the tenor and meaning of the text' (Bringhurst, 2001, p.24).

The startling increase in publishing on the subject of typography practice in the last decade demonstrates a kind of regrouping within the discipline as it reassesses the value of past traditions, including modernist design systems, after a period of frenzied experimentation and the blurring of boundaries across disciplines. Despite this re-examination of the profession, almost none of the new literature addresses typography practice in a screen context. The next section will examine some of the reasons why this deficit exists and look more closely at the nature of typographic publishing. Even though there is an apparent lack of material about screen typography, there is growing and widespread acknowledgment that new media is causing a profound shift in design practice that cannot be answered with the same set of principles that framed the backbone of the last several decades of design for print (Wild, 1999).

3.3 Analysis of the Typographic Design Principles

Following the discussion above, the typographic design principles extracted from the literature review are largely based on texts written by practising designers and educators (Tschichold, 1928), (Lewis, 1963 & 1978), (Dair, 1967), (Ruder, 1967), (Craig, 1980), (McLean, 1980), (Rüegg, 1989), (Hochuli, 1987), (Speikerman & Ginger, 1993), (Carter, Day & Meggs, 1993), (Kunz, 1998), (Bringhurst, 2001), (Kane, 2002), (Baines & Haslam, 2002), (Lupton, 2004), (Jury, 2004), (Samara, 2006) etc. These books encompass the most prevalent and current typographic design principles in use today. For the most part, the methods of practice they expound are written from the author's personal perspective of years of practical experience. Many of the texts incorporate a mixture of references to some or all of the following:

- The history of the written word, printing and digital publishing;

- Personal opinion or philosophy of design

- Science of vision and perception

- Factors affecting legibility (from printing perspective, not scientific or empirically proven)

- Manual of practical techniques and exercises

- Methods of print production (relating to pre-press and press production)

- Aesthetic principles for good design (based on classical principles of beauty, rational principles of modernism, expressive principles of post-modernism or a mixture based on personal preference)

- Historical reference to other art forms (painting, sculpture, photography, architecture etc.)

- Theory of language (written and spoken) and communication (rhetoric, semiotics etc.).

In order to identify a common core set of design principles for typography, a critical comparison of the table of contents and main sub sections of a number of publications shown on the literature map was undertaken. From this critical assessment, the most frequently occurring set of principles and sequence of practical activities were identified and compiled into the table below (table 3.2).

Typographic Principles for Design Practice (Print)					
Context	**Formal Aspects**	**Structure and layout**	**Typographic details**	**Legibility issues**	**Technique / Reproduction**
General knowledge History of lettering Typeface classification Anatomy of letterforms Font families (cases, weights, special characters, numerals, etc.) **Design** (specific context) Text analysis Function of typography Type awareness	**Size** Units of measurement (point sizes, ems) x-height and character width relationship of sizes (Fibonacci etc.) format dimensions **Space** Letter spacing Word spacing Line spacing (leading) Paragraph spacing **Setting** Line length and spacing Alignment Typographic hierarchy and document structure, if applicable (header, footer, folio numbers, chapters, contents, index, prelims etc.)	**Choice and types of format** Paper sizes Paper selection Types of binding **Grid use & development**: including: units of measure number of columns margins and gutters Modular grids Baseline grids Picture grids	**Typographic styling conventions for:** Punctuation Hyphenation Kerning pairs Numerals Symbols, diacritical marks etc. Tabular data Names/addresses	Character recognition Size & text setting Colour and contrast Vision impairment	Typographic sampling Thumbnails Cut and past layouts DTP software production Proofing Files for output

Table 3.2 Table of Typographic Principles for Design Practice (Print). This table was drawn from a laborious process of capturing and comparing the table of contents from a selection of the most recent and most popularly used books on typography design and principles (see Chapter 4, p109-110 for criteria). The lists from these tables of contents were analysed and reduced by grouping similar items or removing duplicates and eventually they were distilled into the above meta-list of typographic design principles for print typography. This meta list of principles was further analysed and sorted into four main critical strands as outlined in Table 3.3 below.

From this assessment, it was also possible to derive some general observations about how they are learnt in practice.

For example, there appears widespread acceptance that the foundation of learning typography should be based on rudimentary principles and practical exercises concerning incremental knowledge of letterforms, words, sentences, paragraphs, composition and hierarchy etc. (Doney, 2003). Indeed many of the key texts examined (Craig, 1980), (Lewis, 1978), (Rüegg, 1969), (Hochuli, 1987), (Kunz, 1998), (Lupton, 2004) present this chronology in their pedagogy, where first principles begin with the anatomy of a letter and the classification of type design, and progress through a sequence of principles dealing with each element (word, sentence, paragraph) before arriving at the design of a full text. This incremental and systematic practical approach for acquiring typographic knowledge is reminiscent of the master-apprentice model in old type workshops. Author and design educator, Ellen Lupton, claims:

> *Typography is an ongoing tradition that connects you with other designers, past and future* (Lupton, 2004).

Further analysis of the core set of principles and methods identified in table 3.2, produced a simplified model that comprised four main aspects of typographic design practice (see table 3.3):

- **Design context or brief** setting out the function and target audience which in turn informs the appropriate visual style and form of the typography;

- **typographic design properties** or characteristics such as: the style and weight of typeface used, its size, spacing and alignment;

- **practical rules or guidelines** governing their correct or appropriate application in design practice.

- **practical techniques and methods** used to visualise the typographic design.

The rules (or principles) governing the design of each typographic element are largely based on accepted tacit knowledge passed down through the decades, from the practice of setting metal type and fine book printing (Morrison, 1930), (Warde, 1955), (Tschichold, 1991), (Hochuli & Kinross, 1996), (Bringhurst, 2001) through the modernist era of experimentation and standardization (Tschichold, 1928), (Müller-Brockman, 1961), (Ruder, 1967), (Dair, 1967), (Gerstner, 1974), (Reügg 1989), (Kunz, 1998), (Malsy, Teufel, & Gejko, 2007) to the less dogmatic, more functional models presented in contemporary literature (Craig, 1980), (Ginger & Speikerman, 1993), (Carter, Day & Meggs, 1993), (Baines & Haslam, 2002), (Jury, 2004), (Kane, 2004), (Lupton, 2004), (Samara, 2006). These rules also incorporate accepted knowledge about legibility factors affecting print typography (Tinker, 1963), (Spencer, 1969) and methods of print production (Lewis, 1973), (McLean, 1980), (Carter, Day & Meggs, 1993), (Baines & Haslam, 2002). Yet, while these rules (or principles of practice) are commonly used as accepted knowledge, they are not empirically proven

(as is the norm in scientific disciplines) and the literature publishing them is not peer reviewed (from a traditional academic perspective).

Typographic Properties, Principles and Methods for Design Practice (Print)			
Context	**Properties/Characteristics**	**Rules/Guidelines**	**Method/Practical Technique**
Function what does it have to communicate? who is the target audience? **Form** what tone of voice, aesthetic style visual treatment is appropriate for the function?	**Typeface Style and Weight** Anatomy of letterforms, typeface classification, font families (cases, weights, special characters, numerals, etc.)	Understanding historical, stylistic, and legible aspects of a typeface in order to make appropriate font selection for design context.	Typographic **sample setting** **Grids** (modular, baseline and picture grids) measurements and number of columns, margins and gutters **Thumbnails** and **sketches** **Cut and paste** layouts **Digital compositions** using DTP software **Paper mockups** & prototypes Digital Files for print production
	Size Units of measurement (point sizes, ems), x-height and character width	Understanding of size sequences & relationships (Fibonacci etc.) and their effect on the visual style, texture, hierarchy and legibility of typography	
	Spacing Letter spacing, word spacing, line spacing (leading), space after/before paragraph, compositional space on page	Understanding the affect of spacing on legibility of words and text and the use of spacing to create emphasis and focal points.	
	Setting Line length and spacing, alignment	Understanding of the relationship of type size and line length in relation to line-spacing and alignment, and their combined affect on the typographic 'colour' of text.	
	Structure (Hierarchy) Typographic hierarchy and document structure, if applicable (header, footer, folio numbers, chapters, contents, index, prelims etc.)	Application of size, spacing and setting principles in relation to bibliographic and hierarchical conventions for document structure and format.	
	2D (Format of Paper) Types of formats (and folds), paper size and number, paper stock, types of binding	Understanding of paper sizes and ratios, and the proportional methods for dividing these (grids) based on an understanding of the laws of proportion (golden section, Corbusier's Modulator etc).	
	Details/Styling Conventions Punctuation, hyphenation, kerning pairs, numerals, symbols, diacritical marks etc., Tabular data, Names/addresses, contact numbers	Application of accepted rules regarding the type style (size, spacing) and setting (alignment etc.) of these details.	
	Colour Contrast of text and background, greyness of text setting	Understanding of basic laws of colour and tone and their application to typography especially with regard to legibility and overall typographic texture.	

Table 3.3 Table of Typographic Principles for Design Practice (Print). The second critical strand, Properties/ Characteristics, shown above was used in conjunction with the diagrams developed in Chapter 2, most especially Figure 2.6, and the Practice Map from Chapter 4 (Figure 4.1) to compare and overlay similarities, differences and gaps identified for screen typography design principles. This critical analysis made a significant contribution to the distillation of properties for screen typography, which are illustrated in Figure 4.119 and in the set of Ruder diagrams in Chapter 6 & 7 (Figures 6.1, 6.3, 6.5, 7.1, 7.5 and 7.6).

In this respect, it is difficult to state with certainty what criteria determine good design and typography.

Criteria for Good Design and Typography

The problem what is good design is subject of much debate in design literature (Walker, 1990), (Forty, 1992) which demonstrate the variance of views by individual designers, design organisations and schools, and different design movements over the course of design history. The meaning of the phrase 'good design' is also problematic because it varies greatly depending on the perspective from which it is viewed, for example: client needs, audience reception, aesthetic concerns, a quality standard etc. Within typography, as highlighted in the earlier discussion, there are vastly divergent views of what is good design (Morison, 1930), (Tschichold, 1991), (Ruder, 1952, 1960, 1967), (Mc Coy & Mc Coy, 1990). For the purpose of this research, criteria for good design is determined from the findings extracted from the review of literature (as discussed earlier in this chapter) and combining them as follows.

The first criterion for good typographic design is derived from what is accepted best practice:

- typography that adheres to the principles (rules) set down in the mainstay of contemporary literature on typographic design principles (see table 3.3 and 3.4), including the appropriateness to the design context (brief) and their application in accordance with known guidelines for legibility and production.

However, while strict adherence to rules may produce technically and functionally proficient typography, questions such as aesthetics and beauty with regard to what is good design are not necessarily addressed. With due consideration to the findings of this literature review, and from the perspective of a practicing designer and educator (with twenty years experience), the researcher asserts two additional criteria (which may sometimes be contradictory) that contribute to a definition of good design.

The second criterion for good design is:

- conformity to stylistic attributes from an accepted stylistic movement (see table 3.4).

The third criterion, is:

- the use of experimentation as an overall approach for guiding practical innovation so as not to limit the design approach to focus on purely functional aspects.

A detailed rationale explaining the importance of experimentation is set out below.

Stylistic Approach/ Movement	Visual Design Attributes	Relevant Literature
classic typography (from traditional book typography)	harmonious classical proportions classical serif typefaces symmetrical composition centred type, justified setting strict adherence to legibility rules use of bibliographic conventions emphasis on craft techniques and material production	(Morrison, 1930) (Warde, 1955) (Tschichold, 1991 – orignally 1947-75) (Kinross & Hochuli, 1996) (Bringhurst, 2001)
modernist typography or International Style	geometric and sans serif typefaces hierarchy of type sizes abstract form and colour dynamic and asymmetric composition adherence to legibility rules use of modular grids objective visual form (photography) emphasis on refined production values	(Tschichold, 1928) (Müller-Brockman, 1961) (Ruder, 1967) (Reügg, 1989) (Kunz, 1998) (Weingart, 2000) (Malsy, Teufel, & Gejko, 2007)
post-modernist design and typography	expressive, interpretative typography experimental and image-based methods (collage, layering, transparency, distortion, deconstruction hand-made, drawn etc.) variety of typefaces optional use of grids non-adherence to legibility rules experimental use of materials	(McCoy & McCoy, 1990) (Poynor, 1991) (Weingart, 2000) (Triggs, 2003) (Holt & Muir, 2005)

Table 3.4 Stylistic approaches to typography and corresponding literature. This table attempts to group some of the main typographic literature under three main stylistic approaches to typographic design and to present an overview of the main design characteristics of each style. This table can be used as a reference to determine what stylistic approach a particular typographic work might be classified under, and to what extent the work demonstrates and adheres to the key design characteristics of that stylistic approach.

Rationale for Experimentation

> *We sometimes discover something very elemental through the most individual expression, while very fundamental visual research could lead to an unexpected grade of expression.* (Wim Crouwel, in Schmid, 1980)

The importance of knowing and understanding traditional typographic conventions including hand-based and craft methods before using technological methods is a constant theme that emerges in almost every contemporary book on the practice of typography. David Jury's book, *About Face: Reviving the rules of typography*, is dedicated to the subject as the first inside spread exclaims in huge type 'Rules can be broken but never ignored'.

In an essay entitled, *Experimental typography and the need for the experiment*, Wim Crouwel discusses the relevance of experimental work to developing the future of the discipline and argues that it has in fact been a feature of practice within the field throughout the last century.

Crouwel distinguishes between two kinds of experimental practice:

1.   work that is pure experimentation, driven by self-expression, unconsciously made with uncontrollable and unknown outcomes, and;

2.   research experiments in typography that have a clear objective, to achieve better solutions to a given problem, through a rational methodical process.

According to Crouwel, only the first kind of typography can be described as truly experimental, because it departs from the primary function of 'making a text readable' to explore the relationship of form and context in a broader sense (Crouwel, 1980). The earliest examples of these experiments started at the beginning of the twentieth century, through movements such as Futurism, Dadaism and Constructivism, where writers and poets literally tried to 'shape' their texts in order to express themselves more clearly. Examples of expressive experimental typography include the work of Stéphane Mallarmé, Guillaume Appolinaire, Filippo Marinetti (figure 3.28), Tristan Tzara, Kurt Schwitters and Theo Van Doesberg (figure 3.28). In these works, typography was effectively liberated from the page by taking advantage of new technology to create dynamic compositions. Traditional text blocks were exploded into expressive interpretations of content in which typographic elements became actors on a stage (Drucker, 1994).

Figure 3.28 Filippo Marinetti, *Zang Tumb Tumb* book cover (1919) and page from *Die Scheuche Marchen (The Scarecrow Marches)* (1922), by Kurt Schwitters, Theo Van Doesberg and Kate Steinitz.

The intuitive methods and innovative typography created through this type of experimental practice inspired others working in the mainstream to re-examine the appropriateness of traditional methods for the changing technological age. Whilst it may seem that experimental and functional typography are opponents of each other, the avant-garde typography of the 1920's had a major influence on mainstream practice. Tschichold's principles were adopted by many practitioners and later developed by others such as Emil Ruder into a more systematic methodology for practice.

Ruder began teaching at Basel in 1949 but did not publish his modernist treatise, *Typographie*, until 1967. It may be assumed that Ruder used the intervening period to experiment with the methodology through its practical application in the courses he taught at Basel. Ruder's book represents a milestone in development of the discipline in that it is one of the first publications to formally describe a universal methodology for typographic practice. Each core principle is comprehensively illustrated and accompanied by a theoretical essay that provides critical context for the practice.

There are few designers whose work crosses into both facets of experimental practice. Wolfgang Weingart (Figure 3.29) and Helmut Schmid (Figure 3.29) are two such designers, who were also students of Ruder. The mainstay of their practice has been methodologically based on clear modernist principles, but both have continued to explore and subvert those principles in personal expressive projects. Their work is both partly problem solving and partly it is close to self-expression (Crouwel, 1980).

Figure 3.29 Ausstellung poster (1978) by Wolfgang Weingart, and cover for IDEA magazine (1966) and music sleeve (1968) by Helmut Schmid.

Weingart and Schmid have contributed significantly to the overall discipline through their writing and teaching, and by their opposing views on Swiss typography. Weingart became renowned for his post-modernist experiments and 'breaking the rules' of Swiss modernist typography, while Schmid has spent most of his career faithfully practicing and spreading the teachings of Ruder. Weingart's experiments were not just a reaction to the dogma of modernism, he wanted to explore the syntactic and semantic relationships within a text through the pragmatic practice of typography. Weingart believes 'one cannot make really good typography without exact knowledge and precise understanding of a text' (Weingart, 1972). The experimental re-arrangements and dynamic layouts of text in Weingart's work naturally led to criticism with regard to legibility, to which Weingart replies; 'the relatively high stimulus of such a text is adequate compensation', because in his view 'what good is readability when nothing in the text attracts one to even read it?' (Weingart, 1972).

In *Design is Attitude*, Schmid recalls a conversation with Weingart, who had become disillusioned with the stylistic trend that his experimental work seemed to spawn,

Let's go back to basics! I do not know where we are going in typography, maybe we will all come back to Ruder (Malsy, Teufel & Gejko, 2007, p.281).

For Weingart, who had devoted his life's work to experimentation in an effort to advance the discipline, this is an acknowledgement of the value of Ruder's fundamental principles. Weingart began to realise, that in order to break the rules, they first need to be taught and it was his belief that the new phase of post-modernist 'experimental' typography did not have this foundation. Perhaps, in recognition of this, the Design School at Basel, under Weingart's direction, have now reinstated the famous *Basics in Design and Typography* course as an intensive summer programme aimed at experienced practitioners and students.

Throughout the twentieth century there have been practitioners who have carried out typographic experiments in order to improve typographic solutions to a given problem. This kind of experimental work is based within the realm of research and has a clear objective which it sets out to examine or prove. Results are achieved through a deliberate process of methodical practical experiments. Among those to create work in this domain are; El Lissitzky, Alexander Rodchenko, Piet Zwart, Herbert Bayer (figure 3.30), Karl Gerstner, Brian Coe, Timothy Epps, Chris Evans and Wim Crouwel (Figure 3.30).

Figure 3.30 *Universal Typeface* (1925) by Herbert Bayer, and *New Alphabet* (1967), by Wim Crouwel.

However, the findings of many of these typographic experiments were not empirically proven nor written up in peer reviewed academic journals as in other professions. Mostly, they were disseminated within the discipline via self-publishing or through practice showcases featured in contemporary non-academic journals and publications. Despite this however, the findings of such work have been broadly accepted and acknowledged by the design community. Rick Poynor claims that throughout its short history, the discipline of graphic design has a tendency to accept what is most widely published, as being the best paradigm (Poynor, 2005). Even Ruder's methodology, which was widely popularised through the journals *Neue Grafik* and *Typographische Monatsblätter*, has never been empirically tested or proven to be the best method for practicing typography. Yet,

as the findings in this literature review show, references to Ruder's seminal publication (figure 3.31), are cited by almost every book about typographic principles that have been published since then.

Figure 3.31 Emil Ruder's book, *Typographie*: *a manual for design* (1967).

Whether empirically proven or not, the need for experimentation in the practice of typography is especially necessary in this changing technological age, if, according to Ruder, 'typography is not to congeal around principles that have long been recognised' (Ruder, 1967). Poynor also acknowledges the need for greater academic rigour in contemporary graphic design publishing about practice. He argues that without a theoretical and critical examination, anthologies of contemporary practice will offer little contribution to the advancement of the discipline, and that experimental work will continue to be imitated rather than understood.

John Warwicker's (Tomato) recent essay *Nameless Thing* in Eye magazine (Vol 14:57, 2005) is a plea for the discipline to recognise the need for experimental work as a worthwhile pursuit that will help to advance the future development of graphic design as a discipline. He fears contemporary design is becoming 'predictable and dull' because of its fixation with 'skill sets' and solutions'. Warwicker cites the Toyko Type Directors Club (TDC) as one organisation not afraid to recognise and reward work outside of the commercial mainstream. Warwicker regards the Toyko TDC's sense of what typography is and can be to be different from other professional organisations. In the context of this research, Toyko TDC has consistently awarded experimental work in screen typography, examples of which will be discussed in the practice review.

Warwicker's overall argument suggests a prevailing complacency that permeates much of contemporary design practice. He pleads with designers to bring experimentation back into their process so that the 'nameless thing', at the core of inspirational work may once again come to the fore.

In this research, the role of experimentation is viewed as a key, contributory factor in what constitutes good design and therefore forms part of the criteria for assessing examples of best contemporary practice.

3.4 Statistical Data from the Literature

A number of interesting statistics emerged as a result of analysing the critical relationships that became apparent from the literature map visualisation.

A total of 223 publications have been included to date on the literature map, split across ten categories (table 3.5):

For Practice	54%
Design Basics	21
Typography (general principles)	59
Grid/Layout	14
Book Typography	8
Screen Design and Typography	24
Total	**126**

About Practice	46%
Education and Critical Writing	27
History	12
By/About Designers	24
Anthologies of Practice	12
Legibility	22
Total	**97**

Table 3.5 Quantity of books in each section of the literature map.

Only 13% of the literature, 30 publications, focuses directly on screen typography and its related concerns and only 9 of the 30 concentrate on design issues, of which 3 are unpublished theses (figure 3.32). A large number of print designers and typographers are represented in the literature as authors. Only 5 screen-based designers feature in both the literature and practice review (figure 3.32)

11.8% screen typography only
11.3% mainly print, small reference to screen
77% print typography only

0.02% screen designers featured in both
literature and practice review
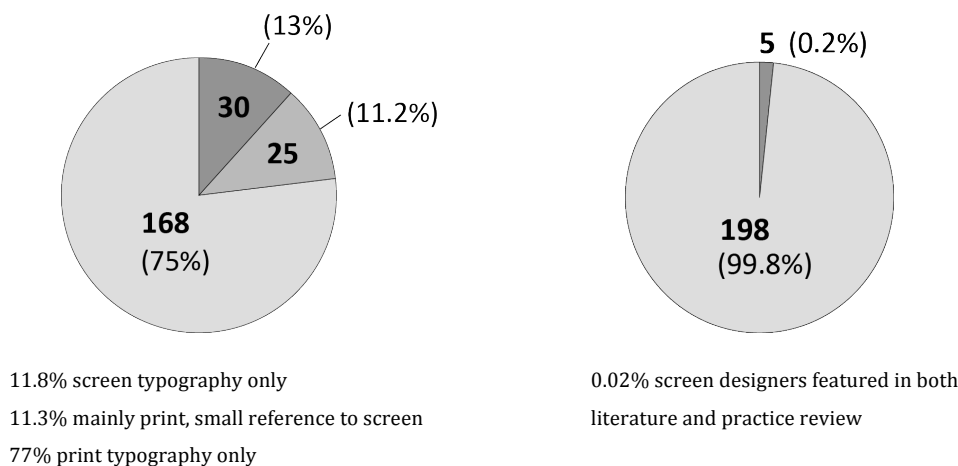
Figure 3.32 Percentage breakdown of literature analysis.

74% of the literature relevant to this study was published from 1990 onwards and 53% of relevant literature to this research has been published from 2000 onwards. These statistics reflect the newness of screen typography as an emergent field and the renewed interest in books about design principles, design basics and modernism (figure 3.33).
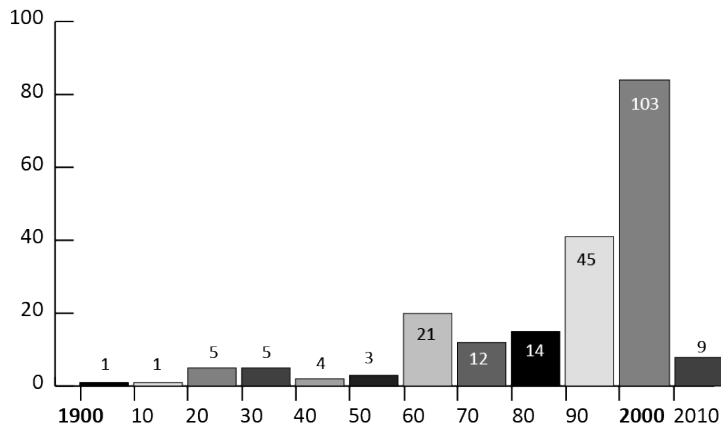
Figure 3.33 Number of relevant publications per decade, 1900–2013.

Visualising the literature has also helped to reveal significant connections between publications. For example, the dominant influence of Swiss typography in the literature was revealed, and connections between authors and subject matter are visible (figure 3.34).

Literature relating to the practice of screen typography is generally found in publications about the broader practice of design for screen-based media, but again specific reference to screen typography and related design issues remain a smaller concern in a larger more general text. The literature represented in the 'screen design and typography' section of the literature map is a mixture of material for and about practice and crosses a number of categories including grids, motion typography and interactive books. It does not include books about general interactive design, web design and user interface design. These topics are relevant to this research but were not specific to the practice of typographic design principles, which is the subject of the literature review. In contrast to the lack of available traditional publications about screen typography, there is a plethora of online publishing about it. The list of these resources is shown in chapter 1, table 1.2.

This perhaps demonstrates, that screen media is the preferred method and platform for publication of literature about screen typography. The same is true of practice showcase publications. Most screen-based work is published on screen media (web, DVD etc.), whereas traditional publishing in the form of designer monographs, anthologies of practice, awards annuals etc., still remains widely used for showcasing contemporary print typographic practice. Screen typography is little featured here – only three such publications are included on the literature map.

Literature Map 1900–2012 Typographic Design Principles

Top panel (FOR PRACTICE):

Beaird
Franz
Tidwell
Neil & Scott
Cho · Götz · Austin & Doust
Small · Diexmann & Gremmler
Sassoon · Duckett
Helfand · Boneu & Solana
Dooley & Heller
Bellatoni & Woolman Vinh
Bellatoni & Woolman Hilner
Götz · Götz · WoolmanBoulton

Von Arx

Mitchel & Wightman
Haslam
Wilson · Hendel · Rafaeli
Tschichold · **Hochuli** & Kinross Bridsall · Klanten & Hubner
Elam · Higgins
Samara · Tondreau
Ambrose & Harris
Le Corbusier · Muller-Brockman · **Müller-Brockmann** · Elam · Ambrose & Harris
Thrift & Roberts · Graver & Jura
Bossard · Ambrose & Harris
Nicolai
White
Squire
Samara
Felici · Elam · Harkins
Jury Cheng Saltz
Gerstner Zaph · Carter · Bringhurst Strizver
Gerstner & Kutter · Swan · Carter Ambrose & Harris
Roberts · Solomon · **Rüegg** · Perfect · **Kunz** · Woolman Kane
Burns · Biggs · **Rüegg** & Frohlich
Muller-Broc · Craig · Lupton
Tschichold Rosen **Ruder** Bain · Dowding · **Denastas & Gallet**
Tschichold · Lewis · **Tschichold** · Dair Bain Lewis · Carter, Day, Meggs Baines & Haslam · **Kunz**
Burns · Ernst Mc Lean · **Hochuli** · Speikerman & Ginger · Ambrose & Harris · Marshall & Meacham
Simon · Aicher
Bill
Sutnar · **Hoffman** · Malcom · Ambrose & Harris
Sausmarez · Dondis · Millman
Itten Kepes · Hurlburt · Lupton & Philips
Kandinsky · Anderson · Wong Maier · Gatto · **Heibert** Bowers Resnick · Bergstrom
Kepes · Moholy Nagy · **Zwimpfer** · Ambrose & Harris

1905 · 10 · 15 · 20 · 1925 · 30 · 35 · 40 · 45 · 1950 · 55 · 60 · 65 · 70 · 1975 · 80 · 85 · 90 · 95 · 2000 · 05 · 10 · 15 · 20

Bottom panel (ABOUT PRACTICE):

Kinross
Noordzij
WalkerHellerYee
Schmid Heller & Meggs
Beirut, Helfand, Heller & Poynor
Heller · Smeijers
Frascara & Solomon
Gill · Carter · Heller Heller
Morison · **Friedman** · SwansonKinross
Kandinsky · Klee Van Doesburg · Warde · **Frutiger**
Marinetti · Lizzitsky & Arp · Smeijers · Hollis Riggs & Grieshaber
Tubaro · Jubert · Anderson & Heller
Drucker · Meggs · Firmage Clair & Busic-Snyder
Schmid · Willen & Strals
Gerstner · Osterer & Stamm
Lane & Lommen
Mc Lean · Holt & **Muir**
Codrington · Ezer
Bignes, Bossard, Fleigchmann
Weingart · Berry
Burke · Boos & Quay
Kinross · Burke
Abbott Miller · Malsy & Teufel & Gejko
Apeloig · Sonoli
Drucker & Mosley
Hochuli · Unger
Bosoni, Campana & von Moos
De Jong & Purvis
Freidrich, Ott, Stein
Poynor · Macmillan
Mc Coy & Mc Coy Göttschall · Müller
Spencer · Spencer Poynor · Blackwell Triggs · Fawcett-Tang
Mayer · Doney
Chermayeff & Geismar · Mutter & Maurutto Larson Larson · Bias, Larson, Huang...
Mills & Weldon · Wiessenmiller · Dyson
Grabinger & Amedeo · Chandler · Stark Adam & Quinn
Koffka · Tinker · Spencer · Dillon · Hill Dyson Quinn
Dillon · Dyson & Kippling

Legend:

FOR PRACTICE
- Screen Design & Typography (24)
- Book Typography (8)
- Grid/Layout (14)
- Typography (59)
- Design Basics (21)

ABOUT PRACTICE
- Education & Critical Writing (27)
- History (12)
- By/About Designers (24)
- Anthologies of Practice (12)
- Legibility (22)

Swiss/Basel Connections

© Hilary Kenna, 2006–2012.

Figure 3.34 Literature Map with Swiss design/Basle School of Design links highlighted. Emil Ruder is highlighted in the centre.

PhD Thesis: Chapter 3: Typographic Knowledge © Hilary Kenna, 2012.

3.5 Summary of Findings from the literature

The findings of this literature review, current at the time of writing (September, 2012) relate to the critical analysis of existing knowledge for print typography and to the knowledge gaps identified for screen typography. These gaps may be explained as follows:

Existing knowledge for print typography

- The nature of typographic knowledge is tacit – learnt, and passed on, primarily through practical experience. The main documentation (literature) of this knowledge has been written by practitioners, and is not scientific or empirically proven as the 'correct' or 'best' knowledge, but is commonly accepted and widely used in practice by the design community.

- A common core set of typographic design principles have been critically extrapolated from the literature. They include a list of characteristics or properties of printed typography, and practical guidelines for the design of those properties that include rules about legibility and methods of production.

- From 1980 to the mid 1990's, design principles (and rules) were rejected by designers as stifling creativity and innovation. The importance of more flexible approaches with an emphasis on experimentation, are viewed as key drivers of change and development especially relevant to contemporary practice.

- Criteria for good typography should include: appropriate application for the design context that addresses readability, legibility, and aesthetic concerns. Criteria for good design and typography, was derived from the existing knowledge set out in the literature (see table 3.2, 3.3 & 3.4).

- Modernist design principles continue to underpin many contemporary publications on typographic design (Hochuli, 1987), (Speikerman & Ginger, 1993), (Kunz, 1998), (Bringhurst, 2001), (Kane, 2002), (Kinross, 2004), (Lupton, 2004), (Jury, 2004), (Samara, 2006) etc. as well as having an a major influence on alternative reactionary approaches (Cranbrook Academy of Arts, David Carson, Jeffrey Keedy etc.) that emerged in the latter part of the twentieth century;

- The evidence of a renewed interest in modernism is confirmed by the growth of new and related literature about it, and by the volume of references to it in other typographic publications;

- Swiss modernist typography and the influence of teaching at the Basel School of Design appears to be widespread across the literature from the 1940's onwards;

- Emil Ruder's book occupies a central location within the literature and his influence can be traced from the 1940's to the present via the students he taught at Basel and their continued practice as designers, educators and authors (see figure 3.34);

- The books of Emil Ruder, Carl Dair and Robert Bringhurst are distinctive amongst the literature for their conceptual and critical approach to practical principles. The majority of typographic literature presents either a pragmatic and functional perspective of practice that often relates to specific methods of production.

Knowledge required for screen typography

- The literature review and map confirms a shortage of literature on screen typography when compared with traditional publishing;

- The literature on screen typography is still emerging, and its main source of publication is through online resources.

- The body of alternative online literature remains hard to quantify and classify and as such is still regarded as 'informal'.

- Properties of screen, identified in the findings of chapter 2, such as 3D space, motion, time, sound and interactivity are not addressed by the traditional design principles identified in the typographic literature.

- The identified properties of print typography and the practical principles, which govern their design application, require further critical analysis in order to assess their suitability for screen practice. A critical review of screen typography practice is required.

- Criteria for good design and typography derived from the literature review will be used to critically review contemporary practice in screen typography.

- In order to address the design properties associated with screen media (chapter 2), other fields of related creative screen practice need to be examined as a potential source of knowledge and literature that can be adapted and extended for designing screen typography.

- The speed of change with regard to methods of technical production for typography necessitates sustainable models of practice not specifically related to technology. Design principles that are conceptually-led, rather than technique-led, are more suited to typography in the rapidly changing technological environment of the screen.

The need for a critical review of contemporary screen typography practice, which is the subject of the next chapter, was identified in the findings of this chapter. The scope and focus of the practice review was also largely influenced by the findings cited above. Specifically, this literature review coupled with the findings from the critical review of screen media and technologies in chapter 2, highlighted the need to extrapolate design principles for practice related to screen typography that are not based on technical methods of production. The next chapter presents a broad examination of the vast and varied practice under the umbrella of screen typography, and attempts to strip away the layers of technology in order to uncover the core underlying design concerns.

Chapter 4. Practice in Screen Typography

Nearly all of the principles still apply. In fact, you often have to follow them more closely with a richer medium like the screen. (Ben Fry, 2007)

...it's absolutely essential to have a traditional typography education in order to be capable of good typography for screens. No question. (Khoi Vinh, 2008)

Returning to the original research question, this PhD study set out to critically examine and practically explore what are the emerging and changing design principles and methodologies in screen typography practice. The broad and emergent nature of the research territory (which is discussed in chapter 2) coupled with the apparent lack of critical design analysis on the subject (evidenced in chapter 3), meant there were few precursors to draw upon when examining contemporary practice in the field, which is the subject of this chapter. The critical review of contemporary practice presented here, is therefore a wide-ranging survey of the many different facets of screen typography practice. This review, which looks at a diverse set of examples, attempts to provide a classification and definition of contemporary practice in the field, and to extrapolate the core design principles for practice used in each of the different areas of practice. At the time of writing, there were no other similar studies available that offer a comprehensive examination of design practice across all aspects of screen typography in a single treatise. The wide scope of the following discussion was born of necessity to best capture what patterns of literature and practice have emerged over the last decade.

4.1 Introduction

The assessment of screen media technologies (chapter 2) and the critical review of typographic literature (chapter 3) provided a solid knowledge base from which to conduct a critical review of contemporary practice in screen typography.

The practice map was derived on the basis of key findings from chapter 2, which clarified:

- the types of screens that typography inhabits;

- their primary usage contexts;

- the nature of audience activity in relation to typography on different types of screens and;

- a set of screen properties or characteristics to describe the screen environment more generally.

In the context of this information, the practice map was used as a framework in which to plot the different types of practical work apparent in the field screen of typography. It provided a mechanism for grouping similar work together, or related types of work into clusters. The populated version of the practice map (figure 4.1) demonstrates that while three critical strands of screen typography were identified, these areas are not mutually exclusive with the majority of practical work crossing over the boundaries of more than one thematic strand. In this respect, while the practice review discussion is structured under three distinct areas, in reality the boundaries between each are blurred.

Practice Map
Screen Typography

Interface/Experience
interactive
HCI, games, programming,
paradigm

Information
static dynamic
print, publishing
paradigm

- information display signage
- data visualisation
- apps
- ebooks
- sofware ui's
- info listings
- cdroms
- web content
- games
- programmatic /generative
- fantasy ui's (fui's)
- installation
- experimental film
- idents
- promos
- ads
- title sequences

Merging Platforms
cinema, television
desktop, laptop
tablet, mobile
consoles
environmental

Narrative
motion
film & animation paradigm

figure 4.1 Practice Map of Screen Typography populated with types of work produced in each area.

Aims and Objectives

Having identified different types of work in the field, the review set out to find a selection of best practical exemplars in each area. However, the broad scope of the review necessitated that it should have its own sub-set of aims and objectives that would serve the overall research question in order to:

- **assess** how traditional typographic properties and principles were applied in a screen-based environment and how they have been adapted or changed;

- **confirm** that typography on screen encompasses new properties (3D, motion, time, sound, interactivity) which do not occur in print typography;

- **identify** what alternative practical design principles and methods were being used to govern the new aspects of screen typography.

Criteria for Inclusion and Assessment

A key problem for this practice review was how to critically select work that typified the nature of practice in each area of screen typography. The method for selection was based on criteria derived from the findings of chapter 2 and chapter 3 where work that would be included had to demonstrate one or more of the following:

- be representative of an area(s) indicated on the practice map;

- show high quality typographic design that addressed functional and aesthetic concerns as per criteria for good design identified in chapter 3, tables 3.2, 3.3 and 3.4;

- an innovative use of typography in a screen based context (that is different to print practice);

- show peer recognition of the designer's reputation and work within the design community.

Having selected a set of samples to critically review in each area of practice (as per the practice map, see figure 4.1), it was necessary to devise a common set of criteria upon which to base the examination and evaluation of the work. The formal analysis and critique of the selected work was based on using the criteria for good design identified in chapter 3, as follows:

- typography that adheres to the design principles (rules) set down in the mainstay of contemporary typographic literature (see chapter 3, table 3.4), including the appropriateness to the design context (brief) and their application in accordance with known guidelines for legibility and production;

- conformity to stylistic attributes from an accepted stylistic movement (see chapter 3, table 3.4);

- the use of experimentation as an overall approach for guiding practical innovation.

These criteria were used to assess the following:

- evidence of traditional design principles at work;

- adaptation of traditional principles for screen;

- presence and design of screen properties such as 3D, motion, time, sound and interactivity (identified in chapter 2, see figure 2.6);

- new or alternative design principles evident in the work.

Of particular relevance to the critical review was the nature of design practice for screen, in terms of the:

- **design process**, **methodology** and **tools** used in making the work;

- **background of the designer** (training, education and professional experience within typographic design or from outside the field);

- **design and usage context** for which the work was made.

Some examples were analysed in detail, addressing most, or all aspects listed in the above criteria, whilst others examples were briefly mentioned in the context of providing an overview of the field.

Sources and Methods

The review of typographic literature revealed that:

- Traditional publishing (designer monographs, anthologies of practice etc.) is the preferred medium for showcasing contemporary print typographic practice and in general screen typography is less featured here. Most likely this is because this work is designed for display on screen and print media can not sufficiently record attributes of screen typography such as motion, sound and interactivity;

- Screen-based sources of publishing, primarily the web (online resource sites/portals, designers' personal portfolio websites, electronic versions of journals and magazines) and secondary to this, disc based media (show reels of individuals/companies, showcase DVDs for traditional journals or magazines, or published titles), are therefore being used to showcase and publish screen typography practice;

- A small number of reputable online resources are linked to a network of well regarded online sources where the best of contemporary screen typography practice is being published.

In the practice review, a number of reputable online resources (see chapter 1, table 1.2) such as *motionographer.com*, *designobserver.com*, *ilovetypography.com*, *smashingmagazine.com*,

alistapart.com etc., were selected on the basis of their professional and educational authenticity, authorship and community membership within the typographic design field. These sites have gained considerable currency and reputation within the field, and reinforce their standing through publishing links, referrals and recommendations between their own sites and other relevant websites. Work published on one of these sites will quickly gain recognition and exposure within the typographic and design community. Often, the work will be critiqued by the authors and editors of the sites, or may be discussed by the online community contributing to these sites. The commentaries (when positive) may be interpreted as a form of approval and recognition within the typographic and design community as to the merit of these works within the field.

In addition to this, these sites have become a conduit for previously little known or unknown designers to post information about, and examples of, new screen typographic practice. These sites also facilitate direct links to the designers' personal websites, blogs and online portfolios where a greater range of work samples and detail about the nature of their practice can be found, as well as the designers' contact details. It was possible to track developments in the practice of individual designers through their personal sites, where many of them publish regular updates of new work as it emerges often with critical commentary, and details of their other activities such as speaking engagements, lectures, interviews etc.

This characteristic proved very useful to this research and resulted in an adjustment of methodology with regard to primary research for interviews. Because of the available detailed material published online by many practitioners, it was not necessary to conduct as many primary interviews as planned in the original proposal. Consequently, a small number of targeted interviews were conducted with practitioners that were representative of the main areas of screen typography practice.

Other online tools such as the *delicious* social bookmarking site, and my *type4screen.com* research blog were used to bookmark and critically annotate noteworthy examples of practice as they were published. The stored entries were searchable and easily retrieved for later reference in practice review.

4.2 **Part A:** Motion Typography

Motion Typography describes work that is primarily viewed as (part of) a linear narrative that exists on the dynamic screen, most commonly in the form of the cinema or television screen, and which contains typography that is moving or animated, and combined with other dynamic visual elements (film footage, 2D/3D animation, motion graphics etc.) and sound.

Origins in Traditional Film

Over the course of the last century and up to present day, typography's relationship with film has been a complex and evolving one that has existed for the most part on the fringes of mainstream activity in both disciplines. Evidence of this can be found by examining areas where crossover activity occurs between typography and film and by highlighting some key examples of practical work that transpired.

The earliest examples of motion typography can be traced back to the beginning of cinema when the first moving images appeared on a screen. Among the first film-makers to include words on screen, and thus identify their role in cinema, was D. W. Griffith. His films *Birth of a Nation* (1915) and *Intolerance* (1916) incorporate title cards that appear at different intervals in the film to provide further clarification on the narrative (figure 4.2). Other film-makers followed Griffith's lead and the appearance of type cards containing narrative snippets or dialogue became common practice in the silent movie era. The titles for Victor Flemming's *Gone with the Wind* (1939), which blow on and off the screen in wind blown italics, is probably the first example of typography treated expressively on screen in a manner that references the subject matter of the film (figure 4.3).

Figure 4.2 *Birth of A Nation* (1915), title card.

Figure 4.3 *Gone With The Wind*, (1939) opening title.

It wasn't until the 1950's and 1960's when graphic designers began to make a noteworthy contribution to motion typography. Designers such as Saul Bass, Pablo Ferro (figure 4.4), Maurice Binder (figure 4.5) and Robert Brownjohn became famous in a period that later became known as the golden age of film titles. The mainstay of screen work they created were titles sequences for film and television, channel idents and advertising.

Figure 4.4 *Dr Stangelove* (1964), opening title.

Figure 4.5 *Goldfinger*, (1964) opening title.

Saul Bass

Bass's influence has probably been the most profound in this area and his practice will be discussed in some detail as typifying activity in screen design and typography during this period.

Figure 4.6 *Man with the Golden Arm* (1955), opening title.

Figure 4.7 *Anatomy of Murder* (1959) opening title.

Bass's now famous signature titles sequences for *Man with the Golden Arm* (1955) (figure 4.6), *Vertigo* (1958), *Anatomy of Murder* (1959) (figure 4.7), and *Psycho* (1960) demonstrate his modernist reductive approach where he tried to distill the essence of the film into a symbolic or metaphorical sequence. Working with a small palette of potent graphic and typographic elements, Bass created dynamic compositions choreographed perfectly to rousing scores. These provocative sequences filled audiences with excitement and curiosity for what they were about to see, and as such spawned a whole genre of film titles design.

Bass's typography in these sequences also shows much innovation. Consider for example; the uneasy animation of the sliced letterforms in *Psycho*, the slab serif outline zooming to full screen in *Vertigo* (figure 4.8), the dynamic continuity of the animated bars and type in *Man with a Golden*, the motion blurring of type driving across the screen in *Goodfellas* (1990), the choice of bold italics condensed type in *Cape Fear* (1991) (figure 4.9) or the beautifully abstract patterns of Las Vegas signage in *Casino* (1996). These treatments, ground breaking as they were then, are today in danger of being reduced to cliché, because of repeated and poor imitation over the last couple of decades due to the proliferation of digital tools and special effects. Many of the techniques Bass laboured over can be digitally implemented with the touch of a button.

Figure 4.8 *Vertigo* (1958), opening title.

Figure 4.9 *Cape Fear* (1991) opening title.

Bass also took great care over smaller typographic details, he chose stylistically appropriate typefaces for the content of the film that were also legible on screen (mostly sans serif in regular or heavier weights). He also observed typographic design principles such as using a limited range of type sizes to indicate hierarchy and give contrast to the information, and well as utilising simple grids for consistent placement, whilst giving a natural rhythm to the typography (figure 4.10).

Figure 4.10 *Psycho* (1960), opening titles.

Bass made no secret of his attraction to modernism (Friedman, 1989, p.17) and whilst his typography might not be described as modernist in the strictest sense (at least in the context of the International style), its influences are apparent in his work. Bass was of an era when handmade techniques were dominant and to produce this kind of work at the time, took considerable ingenuity and painstaking effort.

Bass's systematic design process might also be described as modernist-led. He first storyboarded design concepts meticulously on paper, the worked out design treatments through an iterative series of static compositions before proceeding to final design production for screen. Bass's work demonstrates many characteristics of modernist design. It is based on a clear concept appropriate for its intended context, the visual form is crafted through a rigorous design approach and each media element (typography, photography, cinematography, animation and sound) is flawlessly integrated using the best of available technology.

Bass's output for screen might be viewed as occupying a space between the disciplines of design and film. His screen work formed only a part of his larger portfolio of graphic design work, which contained many significant print projects. From a film perspective, Bass was seen as a novice film-maker, albeit with exceptional aesthetic sensibility for shot composition and editing. His collaborations with high profile directors at Paramount such as Otto Preminger and Alfred Hitchcock started with a print commission for ads and a poster for *Man with the Golden Arm,* and eventually led to film title design. Bass credits Hitchcock as having taught him about 'the art of film-

making' and Hitchcock provided creative opportunities to Bass not normally afforded to designers. Bass storyboarded, shot and edited the famous montage shower scene in *Psycho* to much critical acclaim (and controversy). Hitchcock was allegedly unhappy about the notoriety Bass received and they parted ways shortly after. The tension between Hitchcock and Bass characterises the volatile relationship of 'the collaborative auteur' (Karamath, 2001, p.45), and it is a theme that recurs when reviewing contemporary practice. Bass's own comments in conversation with Billy Wilder (Kirkham, 1995, pp18-91) reveal an interesting anxiety about film titles upstaging the film;

> *it [the title sequence] was the best part of the picture...if you open your mouth too wide with the titles, you can only go down...*

After *Psycho*, Bass began shooting his own material for use in his title designs, *Walk on the Wild Side* (1962) and *Nine Hours to Rama* (1963) are two outstanding pieces.

In the context of this research, Bass's methods and output demonstrate that new and traditional knowledge, specifically practical principles were required in order to design and produce motion typography. From Bass's work, the required multi-disciplinary knowledge was identified as:

- traditional typographic design principles including: care selection of appropriate typeface (from stylistic and legibility perspective), limited number of type sizes, contrast of weights for emphasis, use of grids for consistency in compositional arrangements;

- traditional film-making principles such as: storyboarding, cinematography and shot composition, film grammar and editing,

- animation techniques (rostrum camera work) and sound synchronisation;

- creative collaboration with multi-disciplinary teams.

Origins in Experimental Film and Animation

If Bass was working on the edges of the mainstream film industry, at least his work was part of it, where as a host of experimental film makers and animators were barely recognised within the field. Were it not for the writing of historians and authors such as Robert Russett and Cecile Starr (Russett & Starr, 1976), William Moritz (Moritz, 2004), the unique contribution of this groundbreaking work might be lost to history. Their relevance to contemporary screen design practice (to motion graphics in particular) has been more recently contextualised by Malcolm Le Grice (Le Grice, 2001), Liz Faber (Faber and Walters, 2004) and Matt Soar (Hall and Soar, 2006).

Experimental animation possesses clearly identifiable attributes that distinguish it from mainstream film practice. In his book *Understanding Animation* (1998), Paul Wells provides a detailed discussion of these characteristics including:

Principle	Description
Abstraction	The film does not conform to traditional a narrative story with a beginning middle and end, but uses visual and rhythmic motifs to stimulate the audience's emotional response
Specific non-continuity	Editing within the film is not based on traditional film making principles of editing such as continuity (temporal and spatial so the story makes sense) but on graphic matching and rhythmic relationships between shots
Interpretative form	The content of the film uses a mixture of visual forms, which can include purely abstract shapes, non-representations marks, and material textures and which remain open to interpretation by the audience.
Evolution of materiality	The content of the film is often based directly on the material quality of the film stock – either by painting, drawing or scratching onto its surface or by cutting, splicing, layering and collaging pieces of film together.
Dynamics of musicality	The audio soundtrack of the film is key to devising its (non) narrative structure and composing its visual content. It is also the primary basis upon which timing, editing and synchronisation of shots and movement are designed and built.
Presence of the artist	The films are often idiosyncratic pieces of personal artistic expression and not driven by commercial impetus.

Table 4.1 Principles of Experimental Animation (Wells, 1998).

However, experimental animation also demonstrates some of the classical animation principles in relation to the design of movement within its films. The following table presents a summary explanation of the practical principles of classical animation, as they are clearly defined in the published literature of animation (Blair, 1994), (Thomas & Johnston, 1981).

Principle	Description	Example
Line of Action	Path of direction of the movement, it should be clear and definite It makes the movement readable understandable, and gives them a distinct non-ambiguous direction.	Pursuing a target
Squash & Stretch (also known as weight and volume)	The moving object squashes horizontally in relation to its mass (volume) upon impact with another surface/element and then stretches vertically before resuming its normal mass after moving away from the surface/element of impact. However, the object's mass must be consistent throughout the action.	A bouncing ball

Anticipation	The preparation for a movement or action, which can also be a device to attract the viewer's attention to the proper screen area and to prepare them for the action	Small movement of object (usually slightly in reverse) to indicate a bigger movement – e.g. leg going back before kicking a ball
Follow-through	When an object completes a movement or action, it doesn't halt completely when the movement/action is complete, but continues to move through the momentum of the action before resuming its stopped position.	A swinging golf club doesn't stop upon hitting the ball but follows through over the golfers shoulder in the line of action of the swing)
Overlapping Action	When an object with moving parts completes a movement or action, its parts move at different speed and different times.	A person walking, hair and clothing move in conjunction but at different speed and timing
Slow in / slow out (also known as easing)	The process of starting or stopping a movement or action is gradual not abrupt. A moving object needs time to accelerate and slow down. For this reason, there are more frames in the animation at the beginning and end of an action.	A rolling object starts to move slowly then builds up speed/momentum and gradually comes to a stop
Arcs	Most natural action tends to move along or follow an arched trajectory not a linear one (with the exception of mechanical objects).	Waving action
Secondary Action	This is an action that directly results from another action. It can be used to increase the complexity and interest in a scene. It should always be subordinate to and not compete with the primary action in the scene.	Arms swinging while a person walks.
Timing	The speed of an action (timing), gives meaning to movement, both physical and emotional meaning It makes objects appear to abide to the laws of physics and in doing so indicates their characteristic attributes and intent. Refers to the number of frames for a given action, which translates to the speed of the action on film.	Heavy objects move slower, objects moving downhill go faster etc. Person struggling to pick up something heavy
Staging	Staging is the presentation of an idea so that it is clear, to lead the viewers eye to where the action will occur so that they do not miss anything.	Can be an action, a personality, an expression, or a mood.
Appeal	Appeal means something that the audience will want to see. A scene or character should not be too simple (boring) or too complex (can't be understood).	Equivalent to charisma in a live actor.

Table 4.2 Principles of Classical Animation

The relevance of the principles of experimental and classical animation in relation to identifying new methods of practice for screen typography, will be discussed first, through the work of leading experimental animators such as Oskar Fischinger, Len Lye and Norman McLaren, and later through more contemporary examples.

The creative practice of experimental animation focused primarily on the 'composition of motion'. It was achieved by manipulating and transforming abstract visual forms over time, afforded by the medium of film. Choreography and the design of movement of these visual forms, in accordance with, or against, a soundtrack was the major creative tenet of the work.

William Moritz' description of the work of Oskar Fischinger as a 'visual music' with an 'intriguing spirit' that is suggestive of 'more meanings…beyond the surface value' provides an apt summary of the qualities apparent in much other work in the field (in Griffiths, 1993).

According to Moritz, Fischinger felt that if music could be visualised, it might look like colours and shapes moving through time with differing rhythms, movements and speeds. His films such as *Studies 1–12* made between 1929 and 1932 are creative testimony of this belief (figure 4.11).

Figure 4.11 Stills from Study films, *Studies 1–12* (1929-1932).

They provide an archive of compositional explorations of graphic form through the medium of film. From a graphic design perspective, these works are intriguing. For example, Fischinger's self imposed limitation on the visual vocabulary used in the *Study* films enabled him to focus on the core issue of understanding how to compose visual form in the kinetic, spatial environment of the screen using a piece of music as it structural basis.

The *Study* films might be compared to the modernist exercises in graphic design basics and typography taught by Armin Hoffman and Emil Ruder at the renowned Basel School of Design in the 1950s. Much of their teaching method was based on the rigorous study of elemental visual form (point, line, surface) where students made a series of practical compositions using various visual transformations (figure 4.12). Ruder believed that the art of typography was based on a 'grasp of the essential underlying laws of form' (Ruder, 1960).
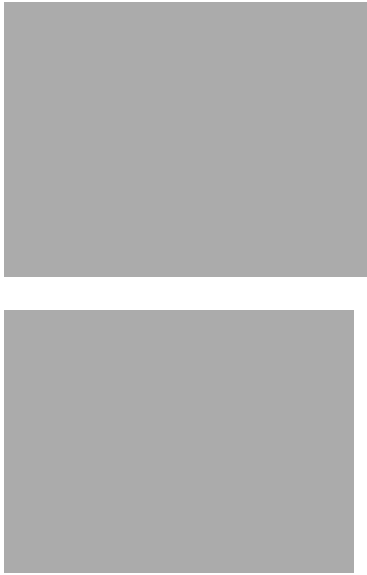
Figure 4.12 Student Exercises from Armin Hoffman's Design Basics class at Basel School of Design.

Fischinger's other films such as *Circles* (1933) (figure 4.13) and *Allegretto* (1936) (figure 4.14) demonstrate a more sophisticated use of form and colour through layering and transparency, and more complex compositions using multiple different graphic elements. Fischinger's creative process was very systematic in order to realise these conceptually complex and multifarious pieces. He would carefully explore interpretative visual forms in response to the music before refining a palette of graphic elements, then storyboarding and breaking down the sound track (by marking each frame of film) so that each element could be composed perfectly (Moritz & Keefer, 1998). This method was also used in classical animation and continues to be used in contemporary practice today.

Figure 4.13 Still from *Circles* (1933).   **Figure 4.14** Still from *Allegretto* (1936)

Another aspect of Fischinger's work, that is suggestive of future typographic exploration on screen, is in the anthropomorphic qualities that are imbued in the abstract graphic elements through multimedia properties such as sound and motion. Classical animation principles are clearly in evidence as the abstract forms come to life through the convincing motion design and dynamic editing that is meticulously synchronised to sound.

Such attributes are apparent time and again in contemporary examples of motion typography (discussed later) and notably fall outside of the remit of traditional design principles.

Norman McLaren, the Canadian animator and experimental film-maker, might be credited with creating the first examples of truly animated letterforms. His advertisement for the *Canadian Board of Tourism* (1961) was played on a 720 foot sign board in Times Square, New York and it literally starred the letters as actors, moving and dancing as they told the story (figure 4.15). The famous typographer Beatrice Warde famously remarked how astounded she was to see what the 'forty centuries of the necessarily static Alphabet' could do in the fourth dimension, which she describes as 'Time, flux, movement' (Woolman, 1999).

Figure 4.15 Still from *New York Light Board* (1961).

McLaren's filmography includes a range of work that also focuses on the transformation of abstract form over time juxtaposed with lively soundtracks. In *Boogie Doodle* (1940) (figure 4.16) and *Begone Dull Care* (1949) (figure 4.17) the visual elements were drawn and painted directly onto the film stock bringing a material sensibility to the films not apparent in the work of Fischinger. McLaren's work was also more consciously self-expressive and seemingly more spontaneous in its composition to sound (McWilliams & Dionne, 1993).

Figure 4.16 Still from *Boogie Doodle* (1940).   **Figure 4.17** Still from *Begone Dull Care* (1949).

In fact many of McLaren's films typify the principles of experimental animation in that they are structured around a small number of visual motifs and their visual transformation (through colour, scale, duplication, distortion etc.) over time in response to the abstract narrative of the soundtrack.

New Zealand born artist, Len Lye's work is also demonstrative of experimental animation principles in terms of its creative emphasis on materiality and through the presence of the artist. Lye's early experiments (painted and scratched on pieces of discarded film from Ealing Studios)

eventually led to commissions for the GPO Film Unit, where he created two of his most renowned films (Rees, 1993). *Colour Box* (1935) encompasses many of the creative interests Lye had been cultivating up until then including primitive and tribal art, kinetic sculpture, photograms and collage techniques on film. The film combines hand painted forms and patterns that dynamically evolve through seamless transitions skillfully edited to the free form rhythms of a jazz soundtrack. The promotional context of the film for the GPO, secondary to Lye's creative intent, is referenced somewhat incongruously.

Figure 4.18 Stills from *Colour Box* (1935).

Lye's next film for the GPO was *Trade Tatoo* (1937) moves away from pure abstraction to include a collage of posterised imagery, silhouetted forms, abstract patterns and some animated text. There structure of the film is loosely based on the narrative about industrial processes and the journey of postal mail. However, it is really the dynamic continuity of the graphic matching transitions between each shot that enables the film to move fluidly to the energetic score. This film signifies all that is modern in today's motion graphics and it is hard to fathom that it was created even decades before the likes of Saul Bass or Pablo Ferro and without the use of modern technology.

Figure 4.19 Stills from *Trade Tattoo* (1937).

The work of Fischinger, Lye and McLaren demonstrates many of the key attributes and techniques associated with classical and experimental animation principles (table 4.2 and 4.1) but which are undoubtedly relevant to contemporary motion graphics. These may be summarised as follows;

• use of abstract form and colour to create the vocabulary of visual elements used in the film;

• combination of mixed media footage (drawn/handmade animation, live action, graphics etc.)

• use of musical soundtrack as the basis for the (non) narrative structure of the film

• dynamic compositions based on graphic matching transitions and visual transformations of form (by colour, scale, duplication, distortion etc.);

- rhythmic editing of shots and detailed synchronization of sound and motion to create maximum impact and interest for the audience;

- emphasis on design of motion based on applying classical animation principles to abstract form (table 4.2);

- visual experimentation based on material qualities of film such as transparency and layering;

- short duration, self-initiated work that is often later used for promotional contexts.

When viewed today, their work appears to have timeless quality, reminiscent of modernist graphic design, that seems to transcend passing fads and technical tricks that date so easily in a field where technical dependency is so apparent. Based on the emerging number of contemporary publications and screenings about experimental animation, there is no doubt that this work has struck a resonant chord in contemporary practice.

Evolution of Motion Design

If Saul Bass was the biggest influence on film titles from the 1960's onwards, then Kyle Cooper's famous sequence for *Seven* (1995), had the next biggest impact on the genre. In fact, Bass and Cooper are probably the most written about designers in this field and any research into screen typography would be remiss not to address their considerable contribution to both the canon of practice and the design process for screen. Interestingly, Cooper was the first to have a monograph published in 2003 while there is still no comprehensive analysis of Saul Bass's contribution to film title design and motion typography. A monograph of Bass authored by Pat Kirkham and Jennifer Bass was published in 2011.

In the intervening period (1970-1990) between Bass and Cooper there seemed to be a general dip in film titles design activity both in terms of output and widespread acclaim. R/Greenberg Associates in New York continued to make interesting work and to explore new technologies and tools for screen design. In television and broadcast design, most of the sustained output from this period emerged in channel brand identity. Some pioneering examples, such as Channel 4's ident (1982) by Lambie Nairn in the UK, demonstrated the creative possibilities of three-dimensional animated letterforms (figure 4.20).

Figure 4.20 Stills from Channel 4 ident animation (1982).

In 1989, Marlene McCarthy and Donald Moffet set up a company in New York called The Bureau. They were noteworthy for the politically and socially motivated nature of their design work both in print and on screen. McCarthy was a graduate (1978-1983) from the film design course at the Basel School of Design in Switzerland and there is a typographic bias evident in her title designs for films such as *Ice Storm* (1997) (figure 4.21), *Office Killer* (1997) (figure 4.22) and *Hedwig and the Angry Inch* (2002). McCarthy's effort to explore the material qualities of film from a typographic perspective, such as the blown snow powder effect on the titles in *Ice Storm*, or the colour projected letterforms creeping around the surfaces of a room in *Office Killer* were clearly influenced by the type of design exploration encouraged at Basel.

Figure 4.21 Stills from *The Ice Storm,* opening titles (1997).

Figure 4.22 Stills from *Office Killer,* opening titles (1997).

The film course at Basel was formed under the auspices of the acclaimed design course in 1968 and it focused specifically on design concerns for film and motion typography. Directed by Peter Von Arx in close collaboration with the design lecturers (Hoffman and Weingart in particular) it remained an important part of the curriculum right through the 1980's when it perhaps reached the pinnacle of its success through the publication of Von Arx's book, *Film and Design*. In 1975, Von Arx had also established a graduate program in film design with an independent curriculum that allowed students to further specialise in this area.

The astonishing aspect of the film course at Basel and Von Arx's accompanying textbook is that it has never received near the acclaim of the design program, nor does it seem to have had the same level of influence on practice in the area of motion design that the design course had on traditional graphic design and typography. Perhaps, it was overshadowed by the relative fame of the design

program and its faculty, or it was because the course curriculum was too rigid and scientifically focused, and the expressive opportunities presented by the course seemed too specific to typography, when film was much more exciting and visually rich medium.

However, this extraordinary niche curriculum is what distinguished it from other design and film courses of the time, and is what makes it relevant to this research. The film course employed the same modernist teaching approach as on the design programme. It referenced Emil Ruder's systematic methodology (used for typography) of breaking down the discipline into 'elementary phenomena and dimensions' that needed to be fully understood before being applied in the context of design problems. There was also an emphasis on mixing hand-based methods with film technology to achieve the desired design outcome. Much of the output from the course took the form of elemental design and typographic studies on film based on a systematic exploration of key phenomena: image blending, time, animation, speed and the camera. There was a blatant emphasis on using type as the formal elements in the work (figure 4.23). The more advanced work produced on the course addressed typographic design problems for filmic contexts defined by Von Arx as; titles and text (film titles, credits and information), symbols (idents), graphic design (filmic accompaniments to print work, often ads) and 'series, concepts and experiments' (structural film experiments, often self-expressive narratives).
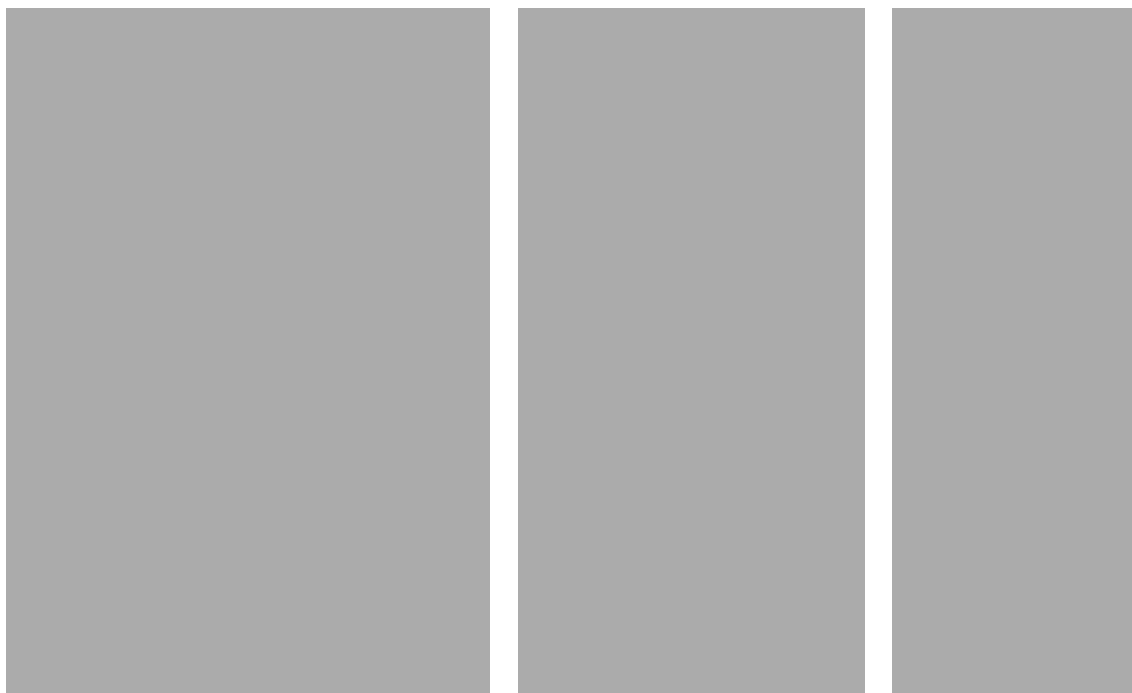
Figure 4.23 Student exercises from Peter Von Arx's class.

Looking at this course work now, it seems to possess a timeless quality (similar to Fischinger and Lye) making it remain modern. The work output not only looked intriguing but the conceptual basis upon which it was founded leaves a lasting impression that remains long after the frames have flickered past. In this research study, the film design course at Basel is critically relevant because it presents guiding design principles and methods of practice for screen. Its contribution to the

rationale, methodology and nature of the practice-led aspect of this research will be discussed in the chapters following the practice review.

During the period of the 1970's and 1980's, it is difficult to ascertain, with the exception of Marlene McCarthy, what impact and influence the film course at Basel had on mainstream practice in the field of motion design and typography.

Meanwhile, in 1995, a little known designer Kyle Cooper (then working for R/GA), created a landmark piece of screen typography that prompted a massive resurgence of interest in film title design and motion graphics (and typography) that has continued to present day. Copper was (literally) projected onto the world stage with his gritty and chilling montage that enraptured audiences at the start of David Fincher's film thriller. The title sequence for *Seven* (figure 4.24) went beyond a metaphorical or symbolic statement to almost provide a prologue to the main film narrative.

The conceptual premise for the sequence was compelling. It was a mini narrative within the film providing insight into the mind of the mysterious serial killer protagonist. It prepared the audience for the film on another level, weaving an intricate web of questions and answers even before the main narrative began.
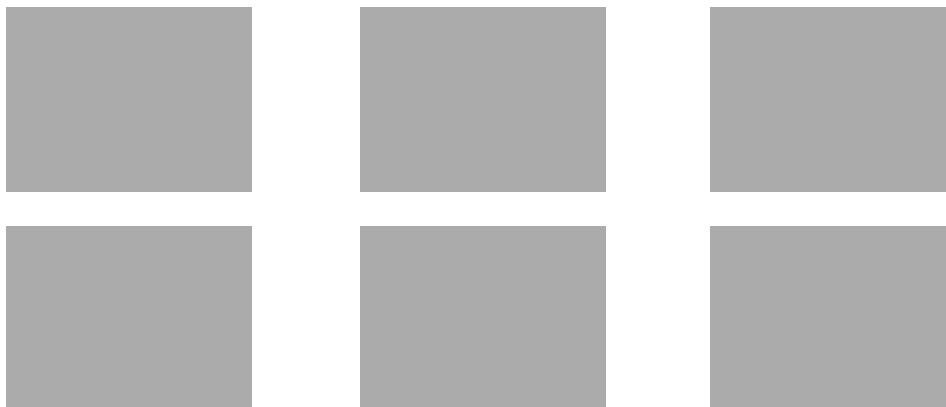
Figure 4.24 Stills from *Seven* (1995) opening titles.

However, it was the graphic design aesthetic and visual treatment of the *Seven* sequence that staggered both audiences and the design community. It was a radical departure from anything Bass or others had previously made, though it did have echoes of Ferro's quick cut editing and letters scratched directly onto film. The design for the actual *Seven* title is a logo-type (the s is replaced with the numeral 7) but the typography is so cleverly integrated that it almost goes unnoticed. The style of the typography in the sequence is a mixture of hand written and cut out letterforms exposed onto film with a flawed and scratchy sensibility. The titles, inter-cut with macro sequences of the killer's hands meticulously recording his obsessions in a scrapbook, are dynamically edited to the grinding rhythm of the Nine Inch Nails sound track.

The impact of Cooper's seminal piece on the field of screen typography practice has been two fold, first in terms of design aesthetics and second on the role of the designer in film.

The aesthetic visual treatment presented in Cooper's title design reflected the debate around deconstruction that was going on in print typographic practice at the time. The sequence shows a blatant disregard for traditional principles in the typography as the words are unevenly spaced and placement is irregular. For Cooper, legibility was not so much a concern as the overall expressive impact of the piece. The typography is blurred into a space traditionally reserved for imagery and complex layering and collage techniques are employed in an uneasy mixture of handmade and digital methods.

The aesthetic treatment of *Seven* has spawned all manner of stylistic imitators, often in the most inappropriate contexts. It may even be possible to suggest that the prevalence of such an aesthetic has influenced software manufacturers to develop filters and special effects that emulate aspects of this style. There is an interesting link between the creative practice of the designer and the collaborative technical effort required to make their designs realisable. It is a theme that continually emerges in any discussion of screen typography and will be notably remarked on throughout this research.

Often when a designer conceives an idea about how to represent type on screen, a technological method created has to be created to make that idea become reality. Often these methods are turned into products such as digital filters, which can be used by others to replicate the original visual treatment at the touch of a button. It is becoming more difficult to ascertain whether innovative examples of motion typography are continually spurring technical development in the area of post-production tools or whether the popularity of particular stylistic effects have resulted because of their instant availability through digital tools. Either way, there is no question as to the infinite number of possible mutable distortions that type can undergo through the use of software applications. Adobe's After Effects' text effects gallery is proof of this (see figure 4. 25). It presents a library of sample movies demonstrating the final outcome of each effect applied to a piece of text in a palette of ready made options.

PhD Thesis: Chapter 4: Practice in Screen Typography © Hilary Kenna, 2012.

Figure 4.25 Adobe After Effects' gallery of text animation presets.

The second area where the influence of the *Seven* title may be extended to is the role of the designer in a film context. For many designers, Cooper's work communicated a creative opportunity for design authorship not previously apparent in a media that was traditionally reserved for animators and film-makers. It also demonstrated design possibilities (for typographic expression) within the medium of film in a visual language that was more familiar to the traditional practice of graphic design. If anything, *Seven* sparked a renewed motivation of interest in this field for designers.

Coincidentally, also around this time, developments in multimedia hardware and software became significantly cheaper and more widely available and designers were able to dabble and experiment in the field like never before. Software for video editing, animation and post-production was becoming easier to use and no longer remained the sole remit of specialist production companies. Design companies were also getting excited about the commercial potential of extending their practice into multimedia and began to look at hiring expertise outside of design. In this environment, a culture of interdisciplinary design began to emerge as traditional designers migrated across the field to experiment with animation and film and vice versa.

A continuing stream of practical work in motion graphic design in the late 1990's began to feature regularly in the practice reviews of reputable design publications (Worthington, 1999) and the culture of motion graphics, or 'motion design' as it is now more popularly referred to (Soar, 2006), quickly became synonymous with design practice. Motion typography may be described as work with particular typographic emphasis created under the umbrella of motion design practice.

In 1999, a book called *Type in Motion* authored by two designer/educators, Jeff Bellatoni and Matt Woolman, became an instant best seller in the design community worldwide. It is a landmark publication, not so much for its scholarly analysis, but rather because it was the first anthology of practice in the field of motion typography. For many designers, much of the work featured was either vaguely familiar or totally new, and for the first time it was possible to get an overall sense of historic and contemporary practice in this field. There is no doubt about the effect the book has had

in an educational context. It is present on almost every design school and course booklist. Bellatoni and Woolman followed up with a text-book shortly afterwards, *Moving Type* (2000), which tries to set out the main design principles for motion typography practice. Critically notable is the inclusion of a CDROM containing practical examples of screen typography that are referenced in the book's content. In the absence of other such texts it is a good introduction to the field and has achieved similar popularity to *Type in Motion*.

Since 2000, based on the findings of the literature review, there was a marked increase in the number of motion design courses, either as part of traditional graphic design programmes or as standalone courses (Heller & Dooley, 2008). The field has grown substantially in the last decade and taken a major foothold in contemporary design practice. Woolman's second anthology of practice, *Type in Motion 2* (2006), and an anthology of film titles, *Uncredited* (Boneu & Solana2007), is further testimony to the explosion of activity in motion typography in the intervening years. The volume of new work published daily on the Internet, via online resources such as *Motionographer* and, make it almost impossible to keep up-to-date with the latest examples of contemporary practice. The critical question is not the volume of work available but the qualitative analysis of its contribution to furthering the field.

Typographic Principles in Motion Typography

Kyle Cooper remains a leading figure in contemporary motion typography practice. After leaving R/GA, he set up Imaginary Forces in 1996 where his title design filmography was considerable, including *Mission Impossible*, *Arlington Road* and *Spiderman* (figure 4.26).

Figure 4.26 Stills from *Mission Impossible, Arlington Road and Spiderman 2,* opening titles.

Later, he left Imaginary Forces to set up Prologue Films in 2004, where he continues to design high profile title sequences for Hollywood films and other motion graphics projects.

No matter what the film, a typographic bias emerged in many of Cooper's designs. He remains one of the few designers in the field of motion design to consistently privilege typography. Cooper has widely publicised his belief that designers working in the field should have a solid grounding in graphic design, especially typography and he makes it a policy to hire such expertise. He believes great animation skills and technical prowess are only one aspect of working as a motion designer and he prioritises the importance of storytelling as well as design and typographic flair as essential attributes for designers working in this field (Codrington, 2003).

This sentiment is echoed by other leading practitioners such as Garson Yu (yU+co), Jonathan Notaro (Brand New School), Gave Ellery (Capacity) and Jakob Tröllback (Tröllback + Company) who were recently interviewed by Digital Arts (Bennett, 2007), in a revealing discussion about the key issues in contemporary practice. Danny Yount of Prologue Films notes that:

> *Print, is something that is meant to be studied and digested. There is less of a tolerance for error and detail can be extreme. The problem with print designers, though, is that they will transfer this same criteria to motion, and it can end up being boring.*

There is general agreement on some golden rules of typographic design on screen, such as the use of sans serif typefaces, generally in medium and bold weights, and an awareness of the technical limitations of type moving too quickly which can cause strobing, or the use of colours that are too intense which causes blooming. Tröllback claims (Bennett, 2007) that:

> *...serif fonts don't make any sense in motion: they are too delicate and... their personality will work against everything you try to create with your motion.*

Yu views a typeface on screen more 'like an actor on the stage' and maintains that any font chosen for a motion project must have expressive qualities that integrate with the overall design of the sequence.

There is also consensus that convergent aspects of the different mediums, such as the detail enabled by HDTV or being able to play video because of broadband Internet, are helping to evolve motion typography. Many companies and individuals now publish their showreels on the web and there are many online resources, such as *motionographer.com* showcasing the most exciting design and technical innovation in the field.

Before, it was much more difficult for practitioners to widely publish their work outside of festival and channel screenings or through hard copy reels. The availability of work online has generated huge interest in motion graphics from the design community.

Amidst the deluge of motion graphics work that has emerged since 2000, it is possible to identify recurring design characteristics in motion typography practice. It is more difficult to find a single practitioner or company whose portfolio consistently exemplifies all of these developments.

 Some significant work examples are discussed here by way of summarising the core design concerns emerging in motion typography. It is important to note that some of the chosen examples, may be 'one-off's' in terms of typographic focus within the designer's/company's broader practice of motion graphics.

Motion and Temporal Design Principles for Typography

There are two significant examples of motion typography, on the first DVD showcase of practice to accompany the design magazine, *Creative Review* (*CRDVD01,* 2000), that clearly demonstrate design principles governing the screen-based properties of motion and time.

The first work is an ad for *CP Hart Bathrooms* (figure 4.27) in Manchester, conceived by the advertising agency McCann Erickson and visually realised and animated by Teak Tse (then at Open Co. UK). The piece is a sophisticated animation of letters sprinkling from a shower head to form key words that are synchronised beautifully to *Aquarium* from *Carnival of Animals* by St. Saëns. The concept for the piece is based on the rainy weather in Manchester and the client's preference for something different (not product shots). The result is a mystical little film comprised of seemingly simple elements (white letters on a black background) that brings a touch of poetry to something that could be potentially mundane.
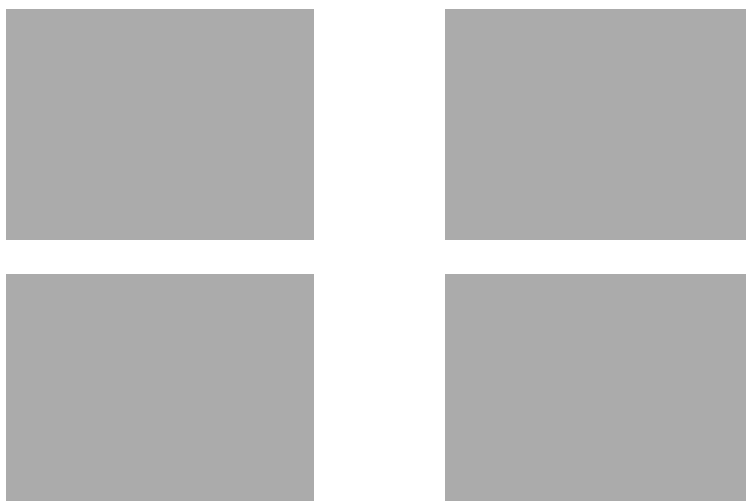
Figure 4.27 Stills from ad for *CP Hart Bathrooms* (2000).

In terms of typography, the limited palette (black and white, a single sans serif typeface in one weight) used in the animation creates emphasis on the meaning of the words that the letters resolve into. The typography is two-dimensional but is animated in a three-dimensional space from a single camera perspective. The camera does not move and the editing is based on simple cuts to different scenes of action that happen within the frame. The movement of letterforms is designed to swathe and flow naturally like water flowing in time with the music. The piece encompasses knowledge evident across a range of fields including graphic design, typography, animation and film; and the application of practical principles from those fields that demonstrate:

- design restraint in terms of clarity and appropriateness;

- good typographic judgment;

PhD Thesis: Chapter 4: Practice in Screen Typography © Hilary Kenna, 2012.

- sophisticated knowledge of animation principles such as line of action, timing, follow-through and secondary action and appeal and;

- a clear understanding of film grammar in the form of shot composition and editing (Katz, 1991).

The piece was awarded a premier ISTD award in 2000.

The second piece of work on *CRDVD01* is a selection of MTV identity break bumpers (figure 4.28) by Spin, a design company based in the UK. This work is included here for two reasons. Firstly, MTV graphics are always a good barometer of latest developments and trends in the field of motion design and secondly, Spin is a company that openly acknowledges it's affinity with modernist typography and also possesses an acclaimed track record in print design. The MTV pieces are very short animated idents that are starkly sparse (single colour, single typeface) considering the visual culture of the client and its audience. Spin's Tony Brook explains in the rationale for the piece, that the intention of the design was to purge MTV of its old grungy style and to present a fresh appearance that would be carried through all of its on-air signage. The ironic little twists and movements of the letterforms reveal iconic forms, which coupled with cleverly chosen sound effects still manage to communicate MTV's social messages. What is particularly innovative about this work is the many different design iterations and meanings that Spin have managed to create from a small refined palette of graphic and media elements. The compositions are bold, strong and decisive and each one has a distinct dynamic intent. The modernist influence on their work is acknowledged by Spin, but in terms of the wider field, it signals a recurring theme of returning to basic principles in the midst of overwhelming digital possibilities.
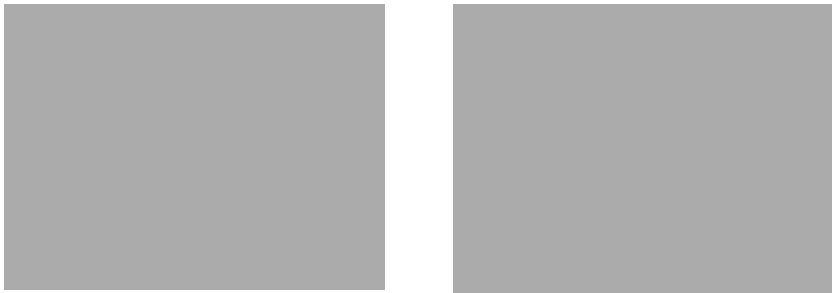
Figure 4.28 Spin *MTV* ident break bumper **(2000).**

There is consistent evidence in Spin's more recent output in motion graphics (see figure 4.28 and 4.29) that modernist design principles, coupled with refined animation skills (based on principles such as line of action, secondary action, staging, timing, and sound synchronisation) continue to underpin their practice irrespective of technological changes and advances in screen media.

Figure 4.29 *More4* channel identity and *Cutting Edge* opener.

Spatial Design Principles for Screen Typography

In 2003, Gary Butcher's piece *Homage to Müller Brockman*, (Josef Müller Brockman is one of the most celebrated modernist graphic designers) was one of the winning entrants in the Creative Review Remix competition run in conjunction with Digital Vision. It was published on *CRDVD06* (figure 4.30). Interestingly, Butcher had previously worked at Spin for five years where self-initiated projects were part of the culture. Butcher's inspiration for the work came from Müller Brockman's Tonhälle posters, which he always thought were like 'single frames of an intensely dynamic graphic film'. The *Homage* piece dynamically constructs the graphic elements of the posters, pausing for a brief moment on the final poster composition before flying off to assemble the next image. The graphic elements and type are animated in accordance with the inferred movement of the original works and thus create a sequence of imaginary 'in-between' compositions. Butcher cleverly analysed the visual forms and identified graphic matching opportunities to create fluid transitions between the different vocabularies of each poster. Editing based on graphic matching and rhythmic synchronicity with the soundtrack, are both evident in this work and reminiscent of the abstract films of Fischinger and Lye. There are important principles underpinning the design of motion graphics compositions and in Butcher's work the choice of subject matter unwittingly makes this process more apparent.
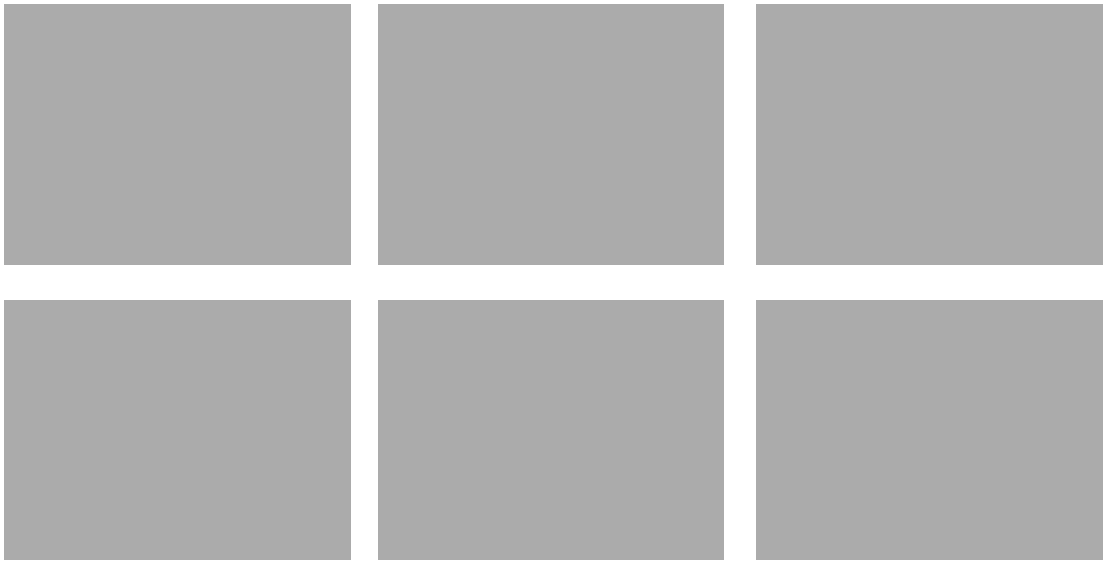
Figure 4.30 Stills from *Homage to Müller Brockman*, Remix Competition, (2000).

The *Homage* sequence possesses many of the design characteristics evident in the plethora of motion work published regularly on resources such as *motionographer.com, res.com magazine and festival,* and *onedotzero.com.* The use of 2D graphic elements, animated in layers in 3D, sometimes with overlaid video footage, and edited in time with an upbeat sound track, are common traits. Matt Soar and Peter Hall describe the genre as:

> *über-motion graphics…a pyrotechnical mélange of computer generated imagery flowing*
> *and ebbing behind type, slickly orchestrated to champion the magical Z axis*
> (Hall and Soar, 2007)

The dynamic composition of graphic elements on screen must take into account the virtual depth of the z-axis in order to create realistic motion on screen that does not appear flat or stuck on the glass surface of the screen. The relationship of 2D elements to the virtual 3D space of the screen is often referred to as 2.5D, because it reflects the prevalent user interface model of motion graphics digital tools (such as Adobe After Effects, Apple Motion) that enable designers to manipulate layers of 2D graphics along the x (horizontal), y (vertical), and z (depth) axes. There is a multitude of motion typography examples that demonstrate how this works. However, one early landmark example is *Intonation* (figure 4.31), by student Jarrat Moody from Savanah College of Art and Design. Moody's piece, which is an animated typographic interpretation of a piece of dialogue from *Pulp Fiction,* gained considerable exposure and attention when he published it on the web via sites such as *motionographer.com*, *typophile.com* and *coudal.com*.

Figure 4.31 Stills from *Intonation, SCAD* student project (2006).

Intonation shows the importance of the wider space beyond the window of the screen to the dynamic composition of elements on screen as they move into, through and beyond the viewing frame. It demonstrates the need for designers to understand this broader screen space in order to conceptualise the design of larger content and how it will move through the single frame of the screen one moment at a time. Intonation deals with the problem of dynamic continuity very successfully by using quick cuts and graphic matching transitions edited carefully to synchronise with the soundtrack. There is also evidence of classical animation principles (line of action, anticipation, easing, overlapping action etc.) applied to the nuanced and fluid motion of the words and letterforms as they move through the screen.

Another example demonstrating motion typography in a spatial context is *Kapitaal* (2005) (figure 4.32), a typographic animation about legible signs in the city by Dutch company Studio Smack. The animation was financed by the De Beyerd Museum in Breda to accompany a symposium on graphic design, and has won numerous prizes at film festivals around the world. The film strives to emphasise the 'the overflow of visual pollution' that almost goes unnoticed, by highlighting the textual content of signs in everyday street scenes, through a stark black and white graphic presentation where the type is reversed out of its surroundings. The team at Studio Smack created a fictional city by photographing many forms of legible information from several cities in the Netherlands, transforming them into black and white 'stencils', and placing them into 3D scenes in 3DS Max and After Effects. The final result is convincing despite the fact it was not shot using a video camera.

Figure 4.32 Stills from *Kapitaal* (2005).

The *Kapitaal* piece demonstrates the composition of 2D elements in 3D space with an emphasis on layering and transparency to create depth, and a clear line of action to move seamlessly through the 3D environment.

The *Homage*, *Intonation* and *Kapital* are early practical examples that illustrate principles associated with managing the design of typography in the virtual third dimension of the screen. In the intervening period (2006-12) there have been countless, and perhaps better examples, which also demonstrate these principles (figure 4.33). As it is impossible to include them all in this discussion, below is a small selection of some of most distinctive work.

PhD Thesis: Chapter 4: Practice in Screen Typography © Hilary Kenna, 2012.
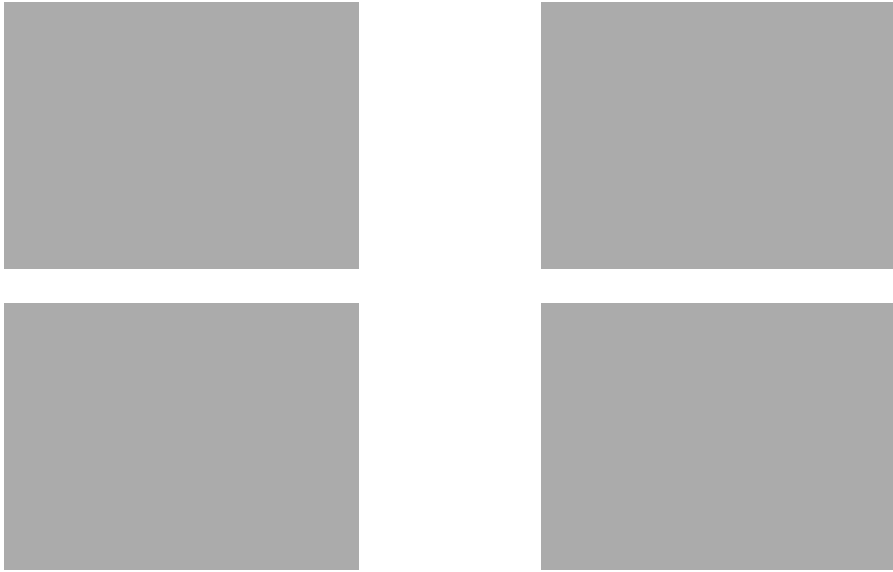
Figure 4.33 Stills from *Catch Me If You Can* (2002) designed by Kuntzel and Deygas, *Stranger Than Fiction* (2006) designed by Ben Kadatz at MK12, *The Cost of War* (2009) designed by Jason Bishop for *Good Magazine* and *The Kite Runner* (2007) designed by designed by Ben Kadatz at MK12.

Computer Generated 3D Forms and Motion

The use of computing technology to generate complex 3D graphics has been prevalent in computer games and animation for over two decades but the striking realism enabled by this technology has really only become widespread more recently. Its influence has also found its way into motion typography where 3D worlds are being created with typography. Examples of motion typography mapping this development can be found first in Alexander Gopher's music video *The Child* (1999) (figure 4.34) designed by Antoine Bardou-Jacquet, and more recently in Brand New School's commercials for Toyota, *Cars that read the road* (2006). These are but two examples of many that have tried to visualise a world through letterforms. Bardou-Jacquet designed all of the 2D typography storyboards in Adobe Illustrator and Photoshop before they were transformed into 3D using Lightwave and Flame. The *Child* was a landmark piece of motion typography at the time it was produced but in terms of the representing the formal qualities of typography on screen, it poorly reflects the discipline.

Figure 4.34 Stills from *The Child,* music video for Alexander Gopher (1999).

Brand New School's work is even further removed from typography in the traditional sense. The photo-realistic typographic environments in the Toyota ads were created using high-end compositing software to mix live action and CGI footage. The letterforms have become images of something else, buried in the form and material of real objects, and there is almost no evidence of a typeface in the strictest sense. While it may typify the farthest boundaries of where type and image collide, it also signals an almost mannerist obliteration of typography through digital intervention in a way that does not enhance or evolve the practice of screen typography.

Figure 4.35 Stills from *The Car that Reads the Road,* ad for Toyota Camry (2006).

In professional practice, the impact of these digital tools has also been considerable on both the nature of design practice and on style of the work being made.

Another winning entry in the 2003 Remix competition was an experimental motion piece called *Anomaly* (figure 4.36) by UK studio Precursor. The purpose of the piece is to explore how a database of information could be visually represented and how that representation is distorted when an error occurs in the data. The inspiration for the piece came from looking at Digital Vision footage of the space shuttle, and the fact that computer error was what ultimately caused the Columbia space shuttle disaster. However, the work is clearly reminiscent of earlier dimensional typography by American designer Muriel Cooper and her protégé Lisa Strausfield at MIT.

Figure 4.36 Stills from *Anomaly*, Remix Competition (2003).

The information graphics content of Anomaly is literally projected and composed in the virtual three-dimensional space of the screen. The camera flies through fields and columns of data,

PhD Thesis: Chapter 4: Practice in Screen Typography © Hilary Kenna, 2012.

zooming in every now and then to provide close up views of the information. *Anomaly* is a typographic document, laid out in three dimensions, visually presented through the lens of a moving camera accompanied by atmospheric spatial sound effects to create a truly believable information space. It capitalises on many of the techniques that After Effects and other such programmes have to offer, right down to the subtle motion blurring of type as it slows in or out of a dynamic transition as it passes through the frame. *Anomaly* is characteristic of much of the design approach and technique evident in contemporary motion typography and made possible by digital tools.

A more recent example of such work is the re-branding of NBC in 2006 (figure 4.37), by Californian motion design studio Capacity. The information design aesthetic coupled with 3D animated camera navigation is evident in all of the channel's ident sequences, program listings and promos. The inclusion of an animated feather from the NBC peacock acts as a cursor that dynamically activates the information in each scene further extends the notion of NBC as a major content provider in the digital age. Capacity's design rationale from their website explains the peacock mouse pointer:

> *...it is used to access information, select characters, to navigate between shows before plugging back into the peacock logo to tie up every promo, bumper, night opener and every other brand-related on-air element* (Capacity, 2006)

The 2D typography in the NBC suite animates fluidly through the 3D information landscape in a manner more akin to surfing a website than to watching motion typography.
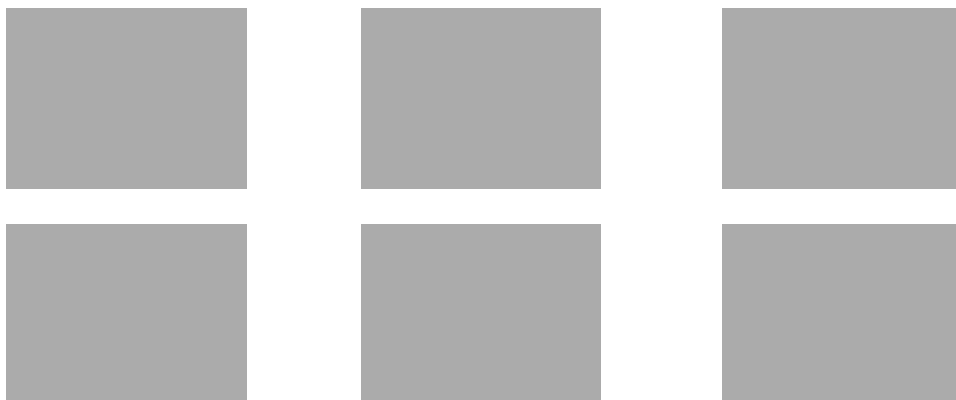
Figure 4.37 Stills from *NBC* re-branding (2006).

This inference of interactivity created through motion graphics is not new and has occurred frequently in other motion design work. It demonstrates the proximity of motion typography to interactive typography as the two cross over and converge through digital media platforms. Many of the stylistic references shared between motion and interactive typography are directly related to the digital tools and programming technologies used in the realisation of design concepts. In some instances the complexity of the animation may be such that it has to be scripted with code. In such cases, the design is described visually through storyboards and motion sketches, but is built by a programmer or special effects operator. For example, leading motion design and production studio

Motion Theory recently used *Processing*, a graphics programming language invented by two leading practitioners in interactive typography (Casey Rheas and Ben Fry) to create information graphics animation for their work. The delicate information overlays created for the *Nike One* (figure 4.38) commercials were generated using Processing and animate gracefully over close-up cinematography. The concept for the ads – a fusion of art and science – is a true reflection of the design methodology used to implement the work by a team of designers, programmers and film makers working together.

Figure 4.38 Still from Nike One commercial (2006).

4.3 Summary of Principles for Motion Typography

Motion design and typography has developed and changed dramatically since the work of early pioneers such as Saul Bass to the complex intricacies of today's digitally enhanced creations.

Motion design can transform type into something else – a three dimensional environment to fly through, to twist, bend and mutate, to be created out of pictures and objects, to act and move and have character, to be intelligently programmed.

However, even amidst the creative minefield that is motion typography, it is still possible to distinguish good from bad design and to perceive how traditional principles are still relevant, whilst acknowledging that new design concerns are broadening the remit of the field.

The following observations summarise the findings regarding practical principles for designing motion typography that were identified in critical review of motion typography as follows:

- Traditional typographic principles are relevant and used commonly, but require some amendment to suit the medium of the screen (typefaces with low contrast strokes and no hairlines, heavier weights of typeface, larger sizes, slightly wider letter spacing, lower intensity colours, simpler grids);

- Traditional design principles must be combined with knowledge from screen native disciplines such as animation and film-making to ensure the typography appears naturally part of a dynamic composition that engages the audience as views, rather than as a flat static composition as in print, which engages the audience as readers;

- Animation principles provide key guidelines for designing realistic and nuanced motion and for carefully integrating movement with sound through methods of synchronization such as sound breakdown and storyboards;

- Film making principles provide an overall grammar for the screen including the types of composition of a single shot, and different methods (graphic, rhythmic, temporal, spatial) for editing sequences of shots together to create narrative structure;

- Film and animation principles share common practical methods, such as storyboarding, sound breakdown and motion tests, for sketching and planning the design of a sequence on screen.

The next section of this chapter examines another major area of screen typography that is static and information-based.

4.4 **Part B:** Static/Dynamic Typography

Static/Dynamic Typography describes work that is primarily information-based static text but which is dynamically updated from an external source. It is primarily accessed via the Internet on the *real-time screen*, using a desktop or laptop computer, a tablet or mobile phone. The typography is usually displayed alongside other media such as images, graphics, video and sound. The predominant audience interaction is reading, or navigating through, the text on screen. The interactive aspect of the typography is limited to the text's navigation system (or user interface) and hyperlinks within the text itself.

Personal Computing and The Internet

The period of time (approximately 1985 to present) during which interactive information-based typography emerged on screen is much shorter (a little over three decades) than that of motion typography (circa 100 years). Nonetheless, the work produced in this short period has been prolific in terms of output, and dramatic in terms of change. The vast output is beyond the scope of discussion of this research, so what is presented is a select sample that exemplify key developments in contemporary practice in this area of the screen typography.

The origins of interactive information-based typography began during the personal computer (PC) revolution of the 1980's, amidst a growing popular culture of computer games and, in particular, with the launch of Apple's Macintosh home computer in 1984.

Figure 4.39 Apple Mac original desktop GUI (1984).   **Figure 4.40** MS Dos command line interface.

The Macintosh (figure 4.39) with its graphical user interface (GUI) and mouse appeared to be the antithesis to DOS (figure 4.40), the command line interface on the PC. New digital design tools (word processing, image-editing, DTP tools) subsequently became available on the Mac and heralded a major turning point in the history of print-based graphic design practice and production. These software applications created a 'dynamic typography' that designers could change instantly via the range of different options provided, such as typeface selection, type size, leading, position etc. figures 4.41 & 4.42).

Figure 4.41 Text dialog box GUI (1984).   **Figure 4.42** QuarkXpress version 5.0 (2002).

With these tools designers could create print-ready work and preview it on screen, and could control as well as execute their own typesetting. They could manipulate typographic form in all sorts of ways, and at speeds, never possible before. These tools revolutionised that way words were created, designed, published, and ultimately read.

Outside of the realm of tool-based applications and user-interfaces, the possibilities of interactive text as entertainment were being explored in narrative based role-playing games (RPGs) and multi-user domain games (MUDs) such as *Zork (1980–82)* (figure 4.43) and *Dungeon (1975)*. Although the formal quality of typographic expression in these games was extremely limited, they perhaps signaled future prospects for interactive typography in a narrative or entertainment context, and represent a precursor as to the contemporary popularity of SMS text messaging, online forums and social networking websites.

Figure 4.43 Text based game *Zork*, (1977).

As far back as 1978, MIT had hosted a demonstration of the interactive media, but it was almost a decade later before it began to emerge as a serious communication medium. However, it wasn't until the early 1990's when a combination of advances in computer technology (standardisation of multimedia computers) and telecommunications (increased capability of networks to transfer media files) became available that the development of multimedia content really began to develop.

Most importantly, due to the first Internet browser, *Mosaic* (1991) (figure 4.44) the Internet became visible and its information content could be easily navigated via a graphical user interface. The era of interactive multimedia began.

Figure 4.44 Mosaic Internet browser user interface (1991).

Against this background the earliest interactive information-based typography emerged.

Multimedia Origins

During the 1990's many content creators set up interactive media divisions and began to publish new or existing content for screen use in the form of interactive CD ROMs, rudimentary websites or interactive information kiosks. Some of the most interesting work emerged from companies such as: The Multimedia Corporation at the BBC (UK), Voyager Publishing (USA) (figure 4.45) and Broderbund Software (USA), and also from the museum sector, which was amongst the first to recognize the potential of the new medium as a means to digitally archive their collection and publish interpretative reference material about it..

Figure 4.45 Voyager's *Expanded Book* toolkit (1994). Voyager designed and produce some of the first interactive electronic books, which included a digital book interface complete with navigation palette, bookmarking facility, progress bar and search function.

Figure 4.46 The *Micro Gallery* (1991) at The National Gallery, London. It enabled visitors to explore the entire collection via a touch screen kiosk including printing out their own selected route.

Figure 4.47 *ArtStart* (2005) at the National Gallery, London (designed by Nykris). Information on all of the collection, including 30 of the gallery's most important works and 30 key artists providing a wealth of detail, including the artistic context, and social background of each painting and painter.

The interactive kiosks at the National Gallery in London (figures 4.46 and 4.47), demonstrate clear and distinctive typographic design treatments for the navigational interface and in the information content. The use of a grid, restraint in typographic specifications and strong information design via typographic hierarchy and composition are evident in both systems.

Other good examples of early screen typography from the museum sector include two CD ROMs, *Le Louvre* (1994) published by Montparnasse Multimedia, and *A Passion for Art: Renoir, Cezanne, Matisse and Dr. Barnes* (1995) (figure 4.48) by Corbis Publishing.

Figure 4.48 Stills from *A Passion for Art: Renoir, Cezanne, Matisse and Dr. Barnes* (1995).

These CD ROMs demonstrate strong typographic design in both the user interface and the presentation of information content. In a review of the *Le Louvre* title, *CultureKioskque* (international arts review web journal) described the CD ROM as striking because of the 'cerebral, French modernist, up-market look of the screens and the central pivot point of the CD ROM's rich data base: an interactive time-line' (Romero, 1995). *A Passion for Art* won twelve awards within three months of its release and was a best selling title for Corbis.

There are few early examples of good typographic design for screen, but these CD ROMs have stood the test of time and unusually for this media (due to technical obsolescence) these titles were republished again in 2001. While the content of these discs is expertly authored for interactive media, there is a timeless quality in the design presentation and typography that may also have contributed to their success. In the same way as modernist typography has endured while other stylistic trends have come and gone, the modernist influence evident in the design of these CD ROMs has helped to ensure that they have become classic titles.

Multimedia and the Design Sector

The pervasive atmosphere of hype and excitement about the potential of interactive media as a new communication medium did not escape the design community. Some notable traditional designers were among the first to engage, both in practice and theoretical debate about the transition from traditional to new media design.

In 1992, the final issue of the renowned journal of contemporary typography, *Octavo 92.8*, created by UK design company 8vo, was published on CD ROM (figure 4.49). It was dedicated to a discussion about the potential that 'new media' promised for typography and communication and the changing role of the future typographer. Heavily referencing Marshall McLuhan, the *Octavo* CDROM predicts how typographic design and communication is about to embark on a new period of development from print to screen display that would be of the same magnitude in communication history as the invention of the printing press.

Figure 4.49 Stills from *Octavo 92.8* (1992).

Designed using only typography and voice over, the piece is deliberately provocative and rhetorical, presenting more questions than answers about the future of design and the established discipline of typography in the volatile and unknown territory of the 'networked screen'. The design of the CD ROM issue tries to imitate the layered narrative typical of the earlier printed versions of the journal, by providing a complex web of interactive links (like hypertext links) within the text. However, the lack of clarity in the navigation seems to create a sense of laborious repetition in the narrative. The large bitmapped typography coupled with the exhaustive use of a blurring transition fail to create the same level of typographic sophistication apparent in the design of the printed *Octavo*. The

Octavo CD ROM is ambitious for its foretelling of the future of typography in a digital age, but it also demonstrates that the transition from print to screen design was not straightforward, especially for traditionally trained designers, and design strategies that work in printed form are not necessarily successful when applied to screen. The last issue of *Octavo* may vilify McLuhan's prediction that one new media never replaces another, but rather a period of mimicry follows where the new media tries to imitate the old media in an effort to define itself (Worthington, 1999).

Other well-known designers who led the charge into multimedia, include Tomato with the landmark *Antirom* (1994) and notably Malcom Garrett of AMX who claimed that multimedia would signal the 'death of print' (Cotton, 1994, p96). Garrett produced one of the earliest examples of interactive typography for a shareware magazine called *n.n.anonymous* that was distributed on CompuServe. The piece called *Digital Collisions* (1992) (figure 4.50) was designed using Photoshop and built in Apple's Hypercard and presents Garrett's own musings on the forthcoming impact of multimedia on the design profession.

Figure 4.50 Stills from *Digital Collisions,* 1992.

The typographic design of the piece exploits and embraces the qualities of multimedia, abandoning traditional principles in favour of an intuitive response to the medium. The typography is limited to Monaco, the Apple system font and there is little evidence of a grid at work in the chaotic layout and layering of multiple text boxes that reflect the multi-tasking nature of interactivity. The low-resolution dithering effect also appears integral to the aesthetic of the piece.

Of the early design pioneers working in multimedia, Garrett and the Tomato design collective did not try to force traditional design methods and approaches onto the design of new media typography. If anything, they seemed happy to abandon the constraints of the old media and relish in the experimental new territory of the screen and the rich media capability it offered. Work by Tomato, such as the *Antirom* CD ROM (figure 4.51), did not try to emulate print traditions but rather departed from them and tried to exploit new possibilities such as motion, sound and interactivity. Perhaps one of the reasons why Tomato appeared so at ease working in new media was due to the multi-disciplinary nature of the Tomato team, some of whose backgrounds included film, animation and sound design.

Figure 4.51 Stills from *Antirom* (1994) CDROM.

The design process and work environment for interactive media was very different to what traditional designers were accustomed to and may help to explain why much of the typography in early multimedia work appears so poorly and awkwardly designed.

Differences in Work Practice

Print designers were slow to migrate to new media as many established design companies felt the technical expertise required was outside their remit and opted rather to offer design as an external service to multimedia companies.

> *Graphic design has traditionally been a service to business…most professionals are content to follow the traditional practice of client want/designer do. In the multimedia environment, however, this may not longer be enough.* (Drennan & Heller, 1997).

Those who made the transition to the new medium often found the technology difficult to reconcile with their traditional methods of practice, and there were few design precursors to learn from In multimedia companies, initially the role of the designer was ill-defined, and other visually trained professions (artists, sculptors, animators, film-makers etc.), as well as non-visually trained professions (writers, content producers, instructional designers) often fulfilled the role. This spawned a breed of new 'screen designers' who were not from a traditional design background but who were trained experientially on the job. Many such designers developed creative and technical skills in parallel and an important interest in the usability contexts of interactive media.

The process of designing and creating typography for multimedia also differed from the traditional practice of design for print. Firstly, designers of interactive media generally worked as part of a multi-disciplinary team, which might comprise a programmer, a multimedia producer for audio and video, a writer and a project manager (Drennan & Heller, 1997). Secondly, 'design' was perceived as a team-based activity, often with each discipline having equal input. As many of the early multimedia companies were technically led, design was often not under the sole remit and control of the designer as was primarily the custom in print. Thirdly, designers, for the most part, were unfamiliar with the process of building interactive media software and were reliant on the technical expertise of other team members such as programmers to implement the visual designs that they mocked up as static images.

In comparison, print designers were used to working autonomously, or as part of a design-led team, and they majority possessed the necessary production skills to construct their designs as digital files ready for printing. In other words, they controlled the exact typographic specifications (typeface, size, leading, line length, layout) of their design. Print designers were generally assured that what they designed would reproduce faithfully in the printed piece (Heller & Womack, 2007).

The typography of early multimedia work comprised of mainly static information presentation, either as textual content or part of the user interface. For small amounts of text, designers created bitmap images of the typography (usually in Adobe Photoshop), which had to be cut up into their constituent parts then imported into the software development environment (multimedia authoring application) and programmed with the appropriate layout position and interactive behaviour (e.g. roll-over, clickable, etc.). In projects with a large amount of text, content was stored in a database or linked to external text files. The typographic display of the text was rendered in real-time, based on the type design specifications provided by the designer, which were coded into the project by the software programmer.

The realisation of typographic design in multimedia was a collaborative process between the designer and programmer. After supplying the type design specifications, the designer had to wait for the programmer to implement them and compile them into an executable file for the designer to see and test. To ensure that the final outcome on screen remained true to the original design specification, the designer had to negotiate a process of iterative testing and modification, which was dependent on time and budget constraints, and the company's disposition to do so. The same basic process described here, of design, specification, technical implementation, testing and iteration is still typical of practice today in software, web and app design and development (Heller & Womack, 2007). The tension between managing creative and technical concerns remains at the forefront of typographic design and practice for screen (McDaniel, 2011).

The multimedia work from 1990-1995 highlighted a number of key issues for the design practice of typography on the computer screen as follows:

- Technologically interactive multimedia was still in its infancy, and as yet its low resolution and poor playback quality meant that traditional mediums of print, television and film maintained their primacy;

- Legibility was a key problem for typography due to the low resolutions of computer screens;

- Typography on the computer screen was emerging in two guises – as interactive information content and as the user interface navigation system;

- Navigation of large texts on screen was difficult and there were no established conventions such as those in print (e.g. books, newspapers, magazines etc.);

- The method of production for typographic design on screen was dependent on technical expertise such as programming;

- The technical methods required to product typography on screen often overshadowed design and aesthetic concerns.

Overview of Web Design and Typography

By the late 1990's, interactive multimedia and CDROM publication were eclipsed by the onset of broadband Internet and the DVD format. Today, the mainstay interactive information-based typography is created for web and mobile content. It is the largest and most complex area of screen typography practice.

It is widely acknowledged that the culture of usage amongst web audiences (and developers) is significantly different to other media and this culture has directly affected how web typography has evolved. Usability expert, Jakob Nielsen famously quoted that, 'web users don't like to read…they want to keep moving and clicking', and that they expect screen text to be shorter, attention grabbing and with the option for to read more if required (Nielsen, 2000). Ellen Lupton also describes the general culture of impatience in the web user, who 'expect to be doing things', searching and getting results, not contemplating, reading and processing information (Lupton 2004).

However in this respect, the web is a conundrum. While it has been generally assumed that readers prefer print to screen for prolonged reading activity, the reality and evidence is now controvertible. A recent study by the Poynter Institute showed that 77% of readers finish reading a news story online compared with 63% in print (Adam, Edmonds, Quinn, 2007). At the same time, more text is published and read on the web everyday than in print. For example, the practice of blogging alone, has shown unprecedented growth with statistics recorded in April 2007 claiming 70 million web blogs being published worldwide (Sifry, 2007).

The insatiable desire of web audiences for new information (of all kinds) has resulted in an online publishing explosion in all sectors of trade, commerce, education and entertainment. The proliferation of textual information on the web (via news sites, blogs, RSS feeds and content aggregators) in the last couple of years has meant that more people than ever before are reading on screen (Wisenbart, 2012). In this context, typography has a renewed relevance, however the demands of the marketplace, namely, the cost of producing information rapidly, has initially taken precedence over typographic concerns such as aesthetics and legibility.

The technology required to drive the presentation of vast and constantly changing content has evolved directly from consumer demands and productivity efficiencies. In order to generate more traffic and return visits from web users, website content must be continually and frequently updated. Users have come to expect this and it is why dynamic content generation has become a de-facto standard in web publishing. Content providers need to produce information fast without

having to redesign it with each new publication and conversely, they also want the option to redesign it without reworking the site's content or programming.

Therefore, the majority of typography on the web is generated by technologies that fulfill these requirements. The general culture of web consumption and the technologies required to support it have greatly affected the nature and practice of web typography. In fact, the concentration on design and technological methods of production for web typography are the main focus of most contemporary literature and debate about practice in this area.

As a result, this review presents more discussion on the nature of emerging practice and the methods used, rather than a comprehensive review of examples of best practice.

Design Process and Method of Production

The basic process of designing and producing typography for websites (see figure 4.52) has generally remained the same since its inception, and is broadly outlined in the following stages:

1. **Conception and visualization of the overall design** of the website, which involves:
   – hierarchically structuring the information
   – designing navigational access routes through the content
   – devising the visual and typographic treatment of the whole site (content and user interface)
   – prototyping the design through a series detailed mockups of web page compositions.
   – detailed design specifications: itemising all aspects of typography (typeface, sizes, alignment, spacing), composition (grid measurements, number of columns etc.) and content layout

2. **Programming of design specifications using various web technologies** (HTML/CSS, Javascript, Flash etc.) to produce webpages that are interpreted and displayed in an Internet browser in real-time according to the user's interactions.

3. **Testing and Iterating the design** based on user feedback

This process, which is very similar to that described earlier for multimedia, is critically dependent on designers and programmers working in close collaboration to implement the typographic design.

Design Process for Web Typography

Design & Development	Production	Product
Designer (+ team)	Designer + Programmer	Audience (user/reader)

Structure & Navigation (information structure, hierarchy, functionality) — User Interface

Design specifications (typeface, colour, typoographic setting) — Typographic Treatment & Visual Design — Design Mockup & Specifications — HTML & CSS development files — Website viewed in browser

Responsive grids (measurements, proportional divisions) — Page Layout & Comosition

Flash development files

Database / CMS text, images, video fonts etc

Figure 4.52 Design and development process for web typography.

Stage 1: Design and Development

In addition to reviewing the literature about web design practice, interviews with three leading practitioners (Khoi Vinh, Ben Fry and Peter Cho), were conducted in order to identify the key practical design principles that govern each stage of the design process.

According to Khoi Vinh, web design expert and former Design Director of the *New York Times* online, good design on screen must first be judged by 'how functional, usable and usable it is' (Vinh, 2008). Vinh suggests knowledge of information and interaction design as well as usability principles are essential for designers working in the realm of the screen.

> *The typography you see in screen designs is a reflection of the behavioural principle; like a button or a widget, it is only one component of the interface whose purpose is to help users achieve their goals.* (Vinh, 2008)

The need for these skills is also recognised by other respected web authorities, such as Jacob Neilsen and Jesse James Garrett, as well as interaction design experts such as, Bill Moggridge (Moggridge, 2007) and Jon Kolko (Kolko, 2011). The principles of interaction design and usability originate in branch of Computer Science known as HCI (Human Computer Interaction) that developed in parallel with software design and engineering. Much of the early HCI literature (Alexander, Issikawa & Silverstein, 1977), (Norman, 1988), (Laurel, 1990), (Pierce, 1994) has provided the foundation for contemporary publishing on interaction design and usability for the web (Neilsen, 2000), (Krug, 2005), (James-Garret, 2010) and the broader filed of interaction or 'user centred' design which refers to the design of any software or hardware products that people use. Formal principles relating to interaction design and usability are new to the practice of typography on screen, where readers do not have the benefit of understanding the five hundred

year old book interface to navigate text. On screen, universal interface conventions and aspects of legibility are still emerging and changing along with the continual development of technology. Key principles of interaction design include topics such as: user requirements gathering and analysis (mapping real world tasks), user type profiling (personas and scenarios), cognitive models and interaction design patterns for creating the user experience (prototypes), testing and feedback (usability principles).

Another key aspect of the design and development stage of web typography, as identified in web and interaction design literature, is the designer's engagement with how to structure and present content to readers/users in an understandable form.

> *How does the designer accommodate the many different ways content will functionally respond to inputs?* (Vinh, 2008)

In this regard traditional principles from information and editorial design for print have proved very relevant. Amongst the leading texts on information and editorial design, which are commonly cited in screen design literature, are the work of Edward Tufte (Tufte, 1990, 1992, 1996), Saul Wurman (Wurman, 1997), (Jacobsen & Wurman, 2000), Jost Hochuli (Hochuli & Kinross, 1996), Rober Bringhurst (Bringhurst, 2001), and Ellen Lupton (Lupton, 2004). The key principles from these texts may be summarised to include: the LATCH principle for organising information (location, alphabet, time, category, hierarchy), macro and micro readings, layering and separation, small multiples, colour and information, narratives of space and time, grids and paper proportions, bibliographic and typographic conventions, and typographic strategies for reader engagement (often called readability).

Stage 2: Production

The production process for web typography is highly technical and radically different to traditional practice. It encompasses two main methods that are used to generate web typography:

- as **static dynamic text** in websites built using markup language such as **HTML (and PhP) and CSS**, in conjunction with other scripting languages such as Javascript (and Javascript libraries such as JQuery) that provide extra functionality for user interface element and aspects of interactivity;

- or **as embedded typography** in websites generated using a software program called Abobe **Flash** or by using sIFR (Scalable Inman Flash Replacement) within a HTML/CSS website.

Design concerns for web typography are common to both methods, but they also have some distinctive considerations. Often web designers will specialise in one of these areas because of the steep learning curve and different skill-sets associated with each. For example, information design and typography is normally the focus for HTML/CSS websites; while motion graphics and

animation may be required for Flash sites. Some examples of practice may however overlap both areas.

The mainstay of online literature about web typography focuses on these technical methods, and in many respects they have overshadowed design and aesthetic concerns. It is because of the technical-led approach to design on the web that this review focused more on the process of practice, than on examples of practice. In fact, the technical process for producing web typography has largely shaped how typographic design practice on the web has evolved. As a result, many examples of good practice are less than awe-inspiring when compared with printed typographic works, and many of the leading practitioners in the field of web typography are known more for their knowledge of (technical) methods than examples of their design work. Even Khoi Vinh agrees:

> *I turn to the work in my design history books for inspiration more often than I look around the Web for aesthetic inspiration* (Vinh, 2008)

Designer, author and data visualization guru, Ben Fry, who was also interviewed in the course of this research, concurs that 'the standard is low, but improving' and that good screen typography should include:

> *…consistency and attention to detail, maybe that's mundane, but once that gets covered, we can get on to the more interesting bits* (Fry, 2007)

The following explanation of the production process for web typography is accompanied by a small number of relevant examples that demonstrates the practice outcomes of that process in conjunction with highlighting the main design properties and principles that are evident in the field.

HTML/CSS Method

Typography built using HTML/CSS is usually static page-based information, drawing content from an external database source. This method is used mainly for large information sites or portals that incorporate multiple sites and online services deployed by a content management system (CMS). The text is displayed in the Internet browser according to the typographic formatting and composition specifications that are detailed in the HTML and CSS files.

HTML/CSS websites use the 'specifying' process to create 'dynamic' typography that is rendered in real-time on the viewer's computer but which may be subject to interference and change based on their type of computer and by their personal Browser settings. This method may require considerable iterative testing and modification to ensure parity of appearance and functionality on all computers and browsers.

It is the predominant method of production for web typography because it separates form and content, and adheres to the Web Standards and Content Accessibility Guidelines laid down by the

World Wide Web Consortium's (W3C) Web Accessibility Initiative (WAI). These standards have become accepted as best practice in many countries where there is a legal onus on organisations to produce information adhering to these standards.

Using this method, typographic design on the web is largely dominated by CSS driven design templates that automate the formatting and layout of text. The basic principle of this methodology is that content and form are separated, so that changes can be made discreetly to each without affecting a complete reworking of the entire site. Websites built using this method typically comprise:

– webpage templates, written in HTML (or PHP) that create the structure and basic layout of the webpage;

– text content stored in a database or CMS (such as WordPress, MovableType, Expression Engine) that is linked directly to the templates;

– a CSS file(s), linked to and referenced in the templates, which details the formal typographic and layout specifications of the webpage.

Changes can be made to the CSS to affect changes in the webpage without having to alter either the HTML template or the source content. It is even possible to modify or change the entire visual design of a website by changing the entire CSS. This process is referred to as changing the 'theme' or 'skin' of a site, and there are many 'off the shelf' themes or skins available that can be customised for the content of any website. In CSS, the typographic design and layout of a page is essentially described as a set of textual instructions written in CSS syntax, a process that is quite abstract and difficult for designers without technical understanding (figure 4.53).

```
/* Begin Typography & Colors */
body {
    font-size: 62.5%; /* Resets 1em to 10px */
    font-family: 'Lucida Grande', Verdana, Arial, Sans-Serif;
    background-color: #d5d6d7;
    color: #333;
    text-align: left;
    }
```

Figure 4.53 Sample CSS rule.

As a means of visualisation, it appears the antithesis to normal methods that a designer would typically use to design and manipulate type, such as sketches, cut and paste paper and digital mock-ups, graphics software such as Adobe Photoshop and Illustrator, or HTML editors such as Dreamweaver for building prototype pages.

However, the leading practitioners that have emerged in web typography appear to have considerable expertise in this area. The prolific amount of dedicated publishing on the topic of CSS (both in books and online) is indicative of just how critical this skill has become to web design practice. It is also one of the most hotly debated topics within contemporary practice and a regular subject of online discussions (McDaniel, 2011).

This method of creating web typography has impacted upon the practice of web design in the following ways:

- **widespread use of CSS themes or frameworks** (that detail all aspects of typographic design, grids, etc.) that are needed for large sites are time consuming and costly to implement from scratch, and have therefore led to a culture of re-use and modification. In other words, many web companies modify the same basic CSS to suit the requirements of different websites;

- **CSS theme modification and adherence to W3C standards has created a 'sameness' in web design**, particularly in large information based sites and portals, nicknamed the 'Web 2.0 aesthetic' (O'Reilly, 2007);

- **designers need to be fully conversant with CSS syntax** in order to build their own CSS, and to understand how CSS relates to the broader development context of building websites (Clarke, 2007);

- the **methodology of CSS** forces a logical and exacting typographic design that **privileges semantics, functionality and productivity** over less quantifiable, and perhaps creative typographic design approaches and methods (Santa Maria, 2005);

- the **technical learning curve of CSS** and its seeming limitations has created a barrier to entry for traditional designers and typographers to engage in web design practice;

- **'off the shelf' templates** may **undermine the traditional role of design,** as a discreet function within web development, as they becoming increasingly more prevalent and popular (there are many sites selling them on the web or giving them away for free).

Practitioners and examples of practice

Contemporary web design practitioners appear to come from assorted backgrounds, some having no formal design training at all. This may be a throwback to the origins of multimedia when those who assumed the role of designer were effectively trained on the job, or it may be due to the unique blend of technical and creative skills required to work in the field. Whatever the reason, the field of web typography has become a mixture of traditionally trained designers (who have moved into the field), emerging young designers with multidisciplinary skills, technically trained developers who have become designers, and an assortment of practitioners from other backgrounds who have developed a keen interest in typography. Many of the prominent figures in the field of web typography have emerged more as a result of their publishing about practice, than for acclaimed typographic excellence in practice (Heller & Womack, 2007).

Those selected for discussion here were chosen by reviewing who were the key contributors to typographic online resources (*designobserver.com, ilovetypography.com, smashingmagazine.com, alistapart.com, subtraction.com, informationarchitects.com*), international conferences (FOWD,

TYPO, Tools of Change) and contemporary publications (*Eye, Baseline, Creative Review, Idea Magazine*), and by identifying awarding winning practice in the field through various published showcases and professional organisations (ISTD, AIGA, TDC, D&AD).

Designers such as Mark Boulton, Richard Rutter, Oliver Reichenstein, Ethan Marcotte, Jeffrey Zeldman (figure 4.54) and Khoi Vinh, to name but a few, have gained international visibility through their online publishing about web design and typography practice methods. Over time, through a process of online referral from key websites and coupled with viral recommendations through social media, these designers have generated significant traffic to their websites and ultimately built up an online community of followers around them.

These designers are actively blogging about the latest developments in the field of web design and typography. They freely share their expertise, advice and opinion and host online discussions about topical issues. In a relatively short time, they and others like them have gained increased professional status online to establish themselves as leading experts in the field of web typography. They are also regular speakers at the vast array of international web conferences and professional events and many have authored, or are currently writing, books about web design practice. These practitioners, and the active grass-roots community online, are effectively defining and shaping the nature and models of web typographic practice. Interestingly, in the context of traditional typography, some of these practitioners are relatively little known.

It is also worth noting that some web typography experts are recognised more for their technical expertise and methods of implementation rather than design and aesthetic concerns.
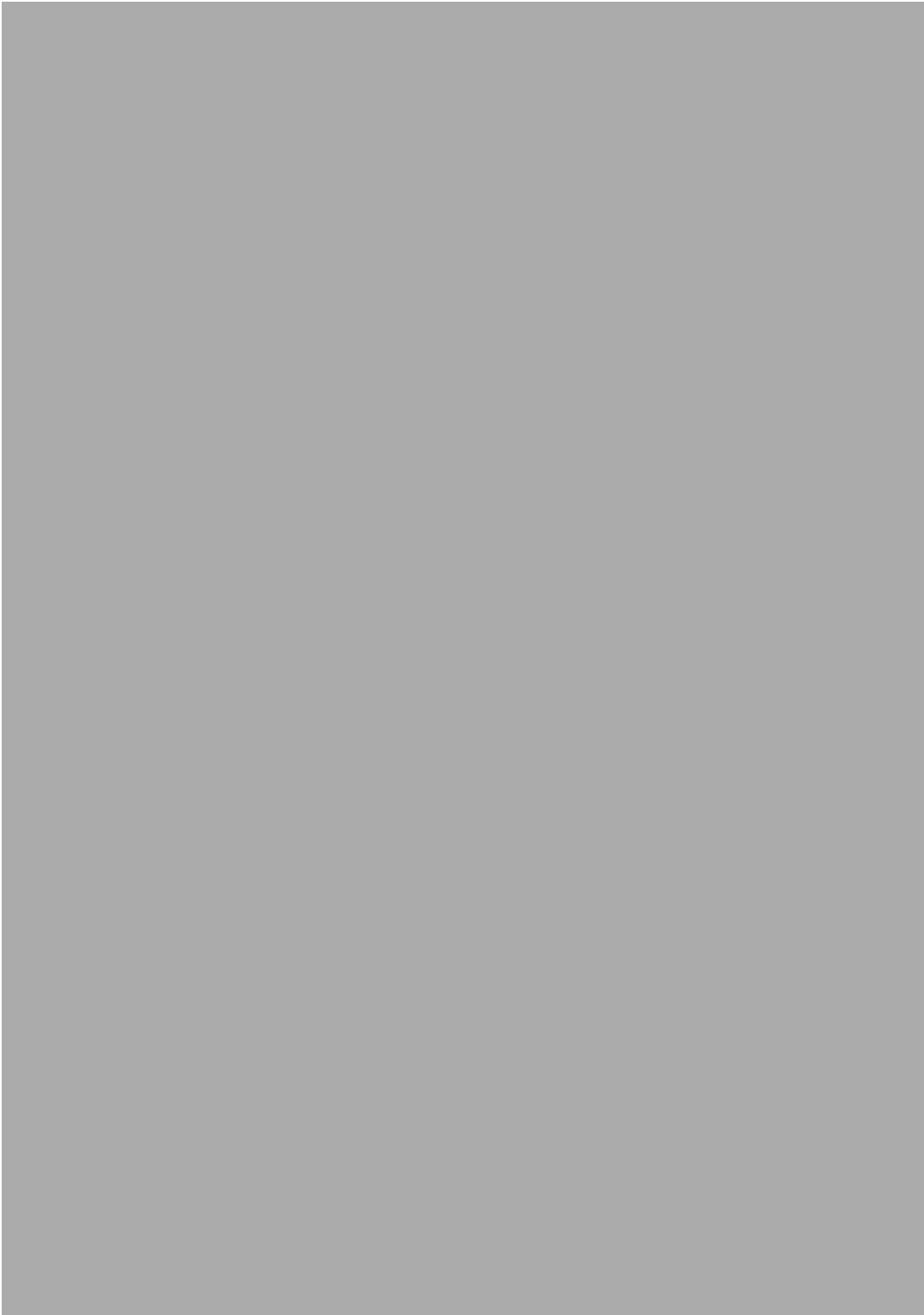
Figure 4.54 Website screen shots of: *Mark Boulton Design*, *Elements of Typographic Style for the Web* by Richard Rutter, *Ethan Marcotte* Design, *Clearleft* corporate website founded by Richard Rutter, *A List Apart Web* Resource founded by Jeffrey Zelman and *Information Architects* (iA) website founded by Oliver Reichenstein.

Khoi Vihn is a web design expert, and former Design Director at the New York Times online, who promotes the importance and integration of traditional design methods within technical processes in web design. His blog is an example of good typographic design on the web and has become a rich repository of critical reflection about the nature and methods of practice from the perspective of a working designer. Vinh, is one of the leading practitioners that were interviewed in the early stages of this research, and he freely acknowledges the influence of a modernist approach to typography that is evident not only in the site design but also in the title, www.subtraction.com (figure 4.55).

> *My most prized book is Design: Vignelli…very Swiss/International; I'm very devoted to this sensibility…it's a really high water mark for what design is capable of. But also, because its minimalist sensibility makes so much sense for the efficiency that the Web demands.* (Vinh in Kenna, 2008)

The site is elegantly composed on an eight-column grid, in one typeface (Arial) using a small range of sizes and weights to indicate hierarchy. The site is primarily monotone, excepting occasional colour photographs, using shades of grey and horizontal rules to create rhythm and contrast in the page. The use of orange as a highlight colour provides an appropriate spark to emphasise interactive links. The line length is short with generous line spacing making the body text comfortable to read. Vihn's site applies traditional typographic design principles to the context of web typography.

Figure 4.55 Screen shots from *Subtraction* blog.

Vinh admits however that while traditional knowledge is 'absolutely essential', he considers the criteria for judging good web typography should focus first on design that is 'functional, usable and

user-focused' and second on whether 'it takes the pains to translate the attention to detail available in print typography' (Vinh, in Kenna, 2008).

Vinh points out the core difference between screen and print typography as an 'overarching tension that lies between the two media':

> *The guiding principle of the former is narrative (i.e. How can a designer create the most controlled, singular expression of the content?) and the guiding principle of the latter is behaviour (i.e. How does the designer accommodate the many different ways content functionally responds to inputs?)* (Vinh, in Kenna, 2008)

Vinh has tried to demonstrate these ideas in his practice through the dissemination of his methodology through various lectures and a book written about the use of grids on the web (Vihn, 2010) and also in his work by creating a commercially available WordPress theme, *Basic Maths* (figure 4.56), which is based on the design of his *subtraction* blog. In doing so, Vinh has effectively productised what was originally an individually crafted bespoke design. This move from single design solution to design solution systems is a significant characteristic in the development of web typography.

Figure 4.56 *Basic Maths* WordPress theme designed and developed by Khoi Vinh and Allan Cole.

Countless websites now use design themes driven by CSS template design, which are freely and commercially available all over the web. Vinh's *Basic Maths* theme is now part of a much larger stylistic set of themes commonly referred to as 'minimalist' design themes.

Derek Punsalan's *Grid-Focus* theme for WordPress (a free open-source Blog and Content Management Tool) is one such example. This theme is freely available and was used by other designers, such as John Boardley in his design blog *www.redsil.com* (figure 4.57). Boardley later launched a typography blog ilovetypography.com (figure 4.57) in August 2007, to instant acclaim, and he openly acknowledged the influence of Punsalan's theme on both his own design work, and in his selection of *15 Excellent Examples of Web Typography*, which is a review of contemporary practice published on iLT. The majority of chosen examples also reveal a 'minimal' aesthetic.

Figure 4.57 Screen shots *ilovetypography.com* (2007) and *redsil* blog (2007) websites using *GridFocus* theme.

The widespread use and customisation of 'minimal themes' is perhaps indirectly promoting a modernist typographic aesthetic, though its application in website design generally lacks the detailed rigour of modernist typography in printed form. Many of the sites using such themes are created by non-designers, and were selected on the basis of preference, rather than design ethos. Ironically, it also means that some of the better examples of web design and typography are the work of non-designers with the technical expertise to modify a 'minimal theme' for their own use.

Lev Manovich describes this collective appropriation of someone else's design as the 'basic logic of cultural production on the Internet' that consists of a continuous loop of actions: 'download, modify, paste into new works online, upload and send into circulation, spread a new trend or style like an overnight plague' (Manovich, 2002).

Bridging the gap between the technical and aesthetic expertise is difficult especially in the context of the HTML/CSS method for generating web design and typography, where currently, the rare breed of designer/programmers are leading the field. Some significant developments are worthy of mention here again because of there impact on web typography practice.

The work of Olav Bjorkoy, a previously unknown Norwegian computer science student, is one of the most interesting developments to emerge in this arena. Bjorkoy released Blueprint, a CSS framework 'for designers' in August 2007, to instant international acclaim within the web design community (figure 4.58). Blueprint is basically a number of CSS files that are clear, logical, well commented and easy to follow. They are purpose-built for a designer's needs and comprise a very detailed set of CSS rules covering all aspects of macro (such as typeface, weight, size etc.) and micro (line heights in paragraphs, lists, blockquotes etc.) typographic specification. There are also separate CSS files dedicated to grid specification, browser re-setting and printing.

```
/* Text elements
---------------------------------------------------------- */

p           { margin: 0 0 1.5em; }
p.last      { margin-bottom: 0; }
p img       { float: left; margin: 1.5em 1.5em 1.5em 0; padding: 0; }
p img.top   { margin-top: 0; } /* Use this if the image is at the top of the <p>. */
img         { margin: 0 0 1.5em; }

ul, ol      { margin:0 1.5em 1.5em 1.5em; }
ul          { list-style-type: circle; }
ol          { list-style-type: decimal; }
dl          { margin: 0 0 1.5em 0; }
dl dt       { font-weight: bold; }
dd          { margin-left: 1.5em;}

abbr,
acronym     { border-bottom: 1px dotted #666; }
address     { margin-top: 1.5em; font-style: italic; }
del         { color:#666; }

a:focus,
a:hover     { color: #000; }
a           { color: #009; text-decoration: underline; }

blockquote  { margin: 1.5em; color: #666; font-style: italic; }
strong      { font-weight: bold; }
em,dfn      { font-style: italic; background: #ffc; }
dfn         { font-weight: bold; }
pre,code    { margin: 1.5em 0; white-space: pre; }
pre,code,tt { font: 1em 'andale mono', 'monotype.com', 'lucida console', monospace; line-height: 1.5; }
tt          { display: block; margin: 1.5em 0; line-height: 1.5; }
```

Figure 4.58 Sample CSS rules from *Blueprint* CSS framework.

Despite the plethora of publishing about 'how to' learn CSS, Blueprint is probably one of the first practical examples to unravel the complexity of CSS for non-technical designers. Blueprint is a perfect example of Manovich's model of Internet production. It incorporates the best practice developed by other experts in the field, such as Rutter, Croft, Borrors, and Meyer, to ensure that it complies with W3C standards. The incredible response to Blueprint (6,000+ downloads and 54,000+ visitors to Bjorkoy's site in the first three days) also demonstrates the desperate need for such a tool by the design community. Almost every online resource or blog relating to web typography published a link to Blueprint or hosted an active discussion about its merits and shortcomings (Boulton, 2007 and Borror, 2007). Khoi Vihn also published an interview with Bjokoy on subtraction.com five days after Blueprint's release, which ensured significant exposure and approval within the web typographic community.

Following on from the work of Bjorkoy, other significant developments in CSS frameworks, which have proved widely used and accessible to designers include:

The *960 grid system* (figure 4.59), by Nathan Smith, designer and developer at Projekt202 in Dallas, is freely available open source and widely used in professional and educational practice.

Figure 4.59 Screen shots of *960.gs* website and template demonstrating the grid use in a page layout.

It aims to streamline web development workflow by providing commonly used dimensions, based on a width of 960 pixels. There are two variants: 12 and 16 columns, which can be used separately or in tandem. The premise of the system is ideally suited to rapid prototyping, but it would work equally well when integrated into a production environment. There are printable sketch sheets, design layouts, and a CSS file that have identical measurements. There is also a variable grid tool that enables designers to decide the measurements of their own grid and have CSS files automatically generated using their specifications.

The *Twitter Bootstrap* toolkit (figure 4.60) was developed by two Twitter employees Mark Otto and Jacob Thornton in 2011 and released in 2012.

Figure 4.60 Screen shot of *Twitter Bootstrap* toolkit user interface components and customisation menu.

It is an open-source front-end toolkit created to help designers and developers quickly and efficiently build online content. It provides a refined, well-documented, and extensive library of flexible design components built with HTML, CSS, and JavaScript for others to build and innovate on. *Bootstrap* is a much more comprehensive offering than *960* and *Blueprint*. It includes responsive grids and a full suite of user interface elements, typographic specifications and colours palettes. *Bootstrap* represents a detailed system for web design and typography built using a range of complex technologies that are hidden from non-technical users and presented as a toolkit that they can understand and use.

These tools, and the technical-led approach of the HTML/CSS methodology in general, have significant implications for designing web typography as follows:

- Design and typography has become **a technical system comprised of pre-made elements** that have been designed to fit together;

- The technical learning curve for designers has meant these systems are being widely used because they offer a means of overcoming the **technological barrier to entry**;

- The prevalent use of these tools has created an abundance of **web design and typography that looks the same** (because it is the same, based on the CSS templates provided);

- These **tools have improved the overall standard** of web design and typography, and have heightened greater awareness of typographic design amongst non-designers;

- They have highlighted the amount of **technical expertise** and time commitment required **to create bespoke design** systems.

Flash Method

Adobe Flash is frequently used for smaller, one-off sites, or to provide media rich content within larger HTML/CSS sites. Websites built using Flash may contain video, sound, animation, narrative based content and motion typography. The typographic formatting is rendered as embedding text inside the Flash executable file (.swf) that is displayed in the web browser. Flash can also be used to display information dynamically from a database driven website by embedding the font and formatting specifications inside the .swf file.

Since the launch of the iPad in 2010, Flash content, is no longer supported by Apple devices. This has led to a significant reduction in its use, and many commentators believe will ultimately be the cause of its demise.

From a design perspective, the Flash based method for creating web typography has yielded a greater range of interesting and innovative work as well as giving rise to more experimental forms of typography that will be discussed later in this chapter. This is due to the fact that the Flash environment is empathetic to traditional design expertise and methods of working.

The software application is designed to cater for both technical (programmers) non-technical (designers) users. It comprises a graphical user interface as well as a code-based environment. The designer can create and format the typographic elements in the same way they would in most other digital design tools (figure 4.61), and most importantly, they can see their design as they create it.
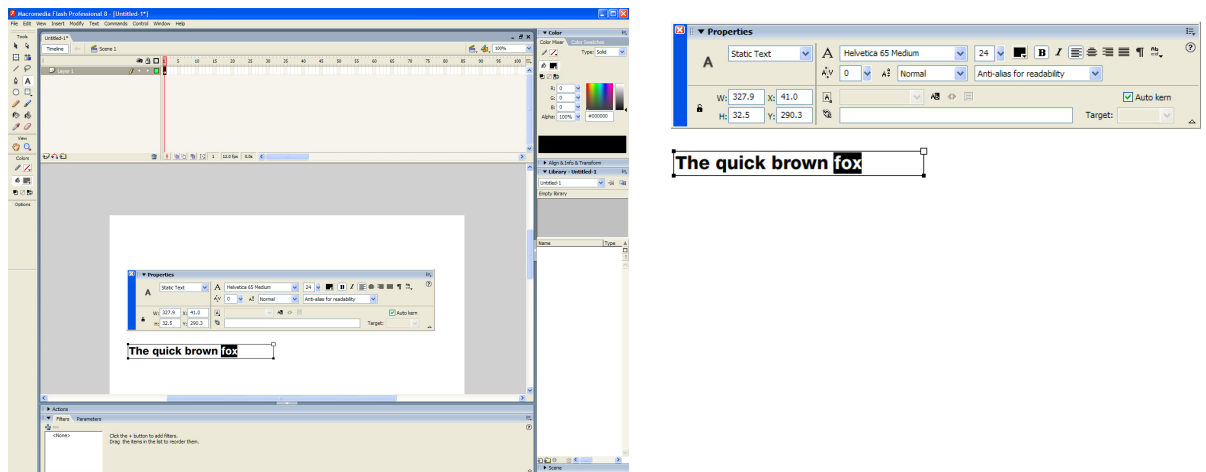
Figure 4.61 Screenshots of Flash GUI, Version 8 (2007).

Because Flash renders typography that is embedded in the Flash executable file (.swf), it generally reproduces online exactly as the designer had intended. On the downside, websites totally generated in Flash are not W3C Standards compliant because users cannot access the text to alter it to their own requirements. Flash content also requires a plug-in to be installed in the user's browser in order to be viewed.

One of the greatest barriers to the full use of Flash for websites is that it can be invisible to search engines. Search engine optimization (SEO) and ranking on search indexes, such as Google is the key to driving traffic to websites. It is also perceived that content within rendered Flash files is non-editable/dynamic and therefore contravenes W3C accessibility guidelines.

The Flash Generation

A new breed of graphic designers emerged in the late 1990's who possessed multi-disciplinary skills for both print and screen media and were proficient working in either medium. This correlates with changes in education provision for graphic design during this period when many courses began to introduce interactive media, web design and motion graphics as part of their curriculum (Yee, 2006). British designer, Fred Flade, is one such example. A graduate of Ravensbourne, Flade created flash websites for Frost Design (figure 4.62), and Spin before going to work at Deepend London, one of the leading creative digital design agencies of the late nineties, but which closed in 2001. Flade and colleagues at Deepend used Flash to create a new type of website design with sophisticated animated user interfaces and kinetic information presentation. In these sites, typography appeared as both user interface and textual content. The static page-based design, typical of HTML/CSS sites, was replaced by a time-based interactive experience more akin to an information movie that is controlled by the reader as director. The typography was animated in fluid transitions complete with sound effects to create a seamless reading experience as the reader navigated their way through an information landscape. In 2001, Flade went on to found De-

construct (which closed in 2010), a creative digital agency, whose original website incorporated motion typography in a spatial user interface (figure 4.62).

Figure 4.62 Global view of website for Frost Design (2000), the highlighted box indicates on page, and deConstruct's website (2010) which also uses a similar spatial navigation system.

It is difficult to pinpoint exactly who were the first innovators to create this type of interactive motion typography but from the late nineties onward, there was a rapid spread of this design style, which new media theorist, Lev Manovich calls 'Generation Flash' (Manovich 2002). He describes its output as having key characteristics;

> *…neo-minimalist aesthetics, the rationality of modernism combined with the rationality of programming, and interactivity comparable to computer games where the power of the computer is used to amplify the user's actions into a narrative sequence* (Manovich, 2002).

Within the design sector some examples of such work stand apart. The Leo Burnett website (figure 4.63) is an exceptionally intricate example of spatial typography rendered fluidly in real-time in response to the users interactions. The use of an infinite white space coupled with kinetic transitions and sound effects and the pencil cursors that effectively allows the user to scribble on the website creates a typographic experience not possible in traditional media.

Figure 4.63 Screen shots of Leo Burnett flash website (2007).

The work of Belgian digital design company, Group94 (figure 4.64) is another consistent exemplar of this style of kinetic, spatial typography mixed with traditional information. There are many examples in their portfolio of work that epitomise all of the characteristics of Manovich's Flash generation.

Figure 4.64 Group94 company website (2012).

The website they designed for the OurType Foundry (figure 4.77) combines all of the innovative visual presentation that Flash can offer from a typographic perspective with extensive interactive capability akin to a software application. The typography is rendered crisply in high resolution scaling smoothly in accordance with a users dynamic selection of typeface, size, weight etc.

Figure 4.65 *OurType* foundry website designed and develop by Group94 (2007).

Group94 have completed a large volume of work in the cultural sector including many portfolio and online archives sites (figures 4.66, 4.67, 4.68 & 4.69) for designers, photographers, artists and content providers.

Figure 4.66 Jeff Wall@MoMA exhibition website   **Figure 4.67** Richard Foster website.

Almost without exception, these sites incorporate a modernist minimalist aesthetic, through restrained typography (one typeface, one size), a neutral colour palette, asymmetric compositions and generous amounts of negative space. The kinetic typographic interfaces are 'magical' (in Manovich's words) to use, as they often emerge from an empty screen in response to one click of the mouse. They are always cleverly understated, but extremely usable, so as not to interfere with the primary content of the site.

Figure 4.68 Manipulator website for Jill Greenberg Studio.   **Figure 4.69** *Koen Demunyck* website.

Group94 are distinguishable from other contemporary practitioners in the field because of the innovative mix of high quality design, typography and technical expertise, which they apply to every project. They also integrate both methods of generating web typography, dynamic (CSS) and embedded (Flash), into their development process.

Essentially, they have created database driven flash rendered typography for their websites as well as a simple back-end content management system (CMS) to enable clients to update their content (figure 4.70).

Figure 4.70 Screenshot of *flash94 2.0* Group94 content management system (CMS) website (2007).

Group94 have proven their ability to transcend the mainstream of best practice in (X)HTML/CSS website development with examples of work such as the Magnum Photos online archive (figure 4.71). Again, a modernist aesthetic is evident in the design of the site. Neutral greys and sans serif typography presented in carefully organised layouts ensure that the content is always fore-grounded within a clear and usable interface framework. The information design is meaningfully

structured and offers multiple and complimentary routes through a complex and vast database of content. The site, featured in a review of contemporary practice by Eye Magazine, was cited as a premier example of web design.

Figure 4.71 Magnum Photos website (2007).

The impact of Flash on web typography can also be found in examples of practice created outside the discipline of design. Much of this experimental work unknowingly contributes to the canon of contemporary screen typography and continues to reveal a modernist aesthetic. Artists and programmers outside the design profession, such as Joshua Davis (www.praystation.com), Golan Levin (www.levitate.com), Yugo Nakamura (www.yugop.com) created experimental works of this kind for some time before the Flash generation of websites emerged in the mainstream design sector. They may well have influenced designers such as Fred Flade and digital design companies such Deepend, Digit, Razorfish and Group 94 who immersed themselves in this kind of work. The experimental typography of these artist/programmers and their contribution to the discipline will be discussed in the next section.

Other examples of practice

The immeasurable and continual growth of web content make it virtually impossible to keep track of, or select, definitive examples of best practice in contemporary web typography.

However, by examining a broad overview of the websites of traditional designers and design companies, it is possible to make some general observations (current at the time of writing in September 2012) about how they have engaged with screen media, web design and typography.

Studios with a modernist ethos evident in their print work, also apply this approach to the design treatment and typography of their websites – Pentagram (figure 4.72), Meta Design (figure 4.73), Speikermann Partners (figure 4.74), Area17 (figure 4.75), MadeThought (figure 4.76), Spin (figure 4.77), are just some examples.

Figure 4.72 Pentagram's website (2012).

Modernist design principles are evident in these websites, including; a minimal aesthetic, asymmetric composition contrasted with large amounts of negative space, restrained understated typography, and highly quality photographic documentation. The quality of information and interface design in these sites also reflect a willing engagement on the part of these studios to extend their practice into screen media with the same rigourous attention to detail that they apply to print.

Figure 4.73 MetaDesign website (2012).   **Figure 4.74** edenspeikermamn website (2012).

Figure 4.75 Area 17 website (2012).   **Figure 4.76** Made Thought website (2012).

Figure 4. 77 Spin's website (2007) made with Flash, Spin's website (2012) and Spin's publishing imprint Unit Editions website (2012).

Other studios have opted to use open source portfolio content management systems such as *Indexhibit* which according to the description on its website (www.indexhibit.org) is a web application 'used to build and maintain an archetypal, invisible website format that combines text, image, movie and sound'. Created by designer/artist Daniel Eatock (figure 4.78) and designer/developer Jeffery Vaska in 2000, it has been used by many artists and designers including Fuel, Graphic Thought Facility and Experimental Jetset (figure 4.79).

Figure 4.78 Daniel Eatcock's website (2012).   **Figure 4.79** Experimental Jetset website (2012).

Sites built with *Indexhibit* also tend to have a minimalist design style, often with little or no customisation to the default list navigation and image viewer window that come with the tool. There are other similar tools available including *StaceyApp* as well hosted online portfolio platforms such as *Behance*, which was launched in 2006.

It is possible to argue that by using such tools, traditional designers may be freed from having to engage with the unfamiliar technical territory that is web design where the process of devising their own creative solution for a website interface may prove too difficult technically. Achieving typographic control on the web is a complex technical process and can be frustrating for traditional designers who desire the same amount of typographic control that they are used to in print.

Another area of web design where traditional design principles are evidently in use, and where examples of good design are apparent, is editorial design and publishing. Too vast to review in this study, on example in particular is worth mentioning. Mark Porter's design of the *Guardian Newspaper* online edition is on such example (4.80). Porter's work at the *Guardian* is often used as an exemplar in the contemporary literature on web design and his identity and editorial system for the web has also been translated and adapted for other screen devices such as mobile and tablet platforms.

PhD Thesis: Chapter 4: Practice in Screen Typography © Hilary Kenna, 2012.

Figure 4.80 The Guardian Online (2012).

4.5 Summary of Static/Dynamic Typography Principles

Over the course of this research study (1994-2012), the technical-led approach to web typography has continued to determine how typographic practice on the web has evolved. This approach has identified:

- The emergence of web culture with an insatiable demand for new and changing content along with shorter attention spans and new way of reading based on scanning and clicking (Lanham, 2006), (Neilsen, 2000).

- Widespread use of the HTML/CSS technical method and 'CSS template design' driven by a database content management system (CMS) underneath to deliver information that meets this demand.

- Adherence to W3C standards movement.

- The need to display the same body of content on multiple different screen devices (computer, tablet, mobile), a phenomenon called 'responsive design' (Marcotte, 2010).

In terms of typographic design properties:

- Web typography remains predominantly static/dynamic information and traditional principles such as typeface, scale, setting, alignment and line-length, and line-spacing are particularly relevant albeit with adaptation in accordance with guidelines for good screen legibility.

- The main interactive aspect of static/dynamic typography is navigation and the navigation interface representation usually in the form of text base links or buttons.

- Other properties such as 3D space, motion, time and sound are only beginning to emerge in HTML/CSS typography, but have been continually relevant to Flash typography (which is now rapidly in decline).

- Traditional typographic design principles are relevant and realisable through both methods of production, while additional principles from information design and interaction design represent new forms of knowledge for typographic design on screen.

A number of technical developments have greatly improved the capability for typographic design and display on the web:

- Higher quality screen resolutions, closer to print quality (e.g. iPad 2.0 retina display is 260dpi).

- Availability of any typeface (no longer limited to web-safe fonts), through the addition of the CSS typeface specification tag *@font-face,* coupled with the resolution of online distribution licensing and typeface formats, as well as web the emergence of online foundries such as Adobe Typekit.

- Extended typographic and design control in the latest versions of HTML4 & 5 and CSS 2 & 3 such as: kerning, baseline grids, transparency, drop-shadows, layering, etc

- Improved Internet browser rendering of typography including better anti-aliasing etc.

- Use of responsive grid sytems, CSS templates and standarised web design toolkits to create consistent information presentation across different screen devices.

- Extended user interface and interactive functionality (animation, drag n' drop, follow cursor, editable, hide/reveal etc) through Javascript libraries such as JQuery, which enables text to respond to the user's interaction.

Thus far, this chapter has examined two of the main areas of practice in screen typography: motion typography, and information-based typography (which is primarily web-based). The core practical principles used in both have been identified as referencing traditional typographic knowledge (albeit adapted for screen) combined with greater emphasis on practical principles driven by other disciplines such as animation and film making, as well as information design. Key factors affecting the legibility of text on screen and emerging standards concerning accessibility are also critical principles that must be acknowledged when designing screen typography.

It is also clear at this interim point in the practice review, that the other major area of practice – interactive typography, combines aspects of both motion typography and information-based typography, and that the boundaries between different types of media on screen and different types of screen devices are in fact blurring. For example, televisions, which were once the preserve of linear narrative entertainment, now incorporate Internet access and are increasingly being used for other purposes such as communication (via video conferencing) and information retrieval. Equally,

communication devices such as mobile phones are being used for email, photography, and as entertainment consoles.

The third part (C) of this chapter examines examples of screen typography, termed interactive typography which represents crossover work that encompass aspects of the motion and information typography, but for which additional practical principles from other screen-native disciplines, such as human computer interaction, user interface and game design, have been identified.

4.6 **Part C:** Interactive Typography

Definition

Interactive Typography describes work with an interactive emphasis on either functional (user interface) or interpretative (experience) forms. It exists primarily on *real-time screens* but also on bespoke *screens as augmented space* (see Chapter 2) in the form of environmental signage and installations. This form of typography may incorporate motion and static/dynamic typography, with other forms of programmatic and generative typography. It usually requires significant interaction on the part of the audience, not just reading or watching. Work in this area often maximizes the latest developments in technology (relevant to it's the time it was created) and might be described as 'leading-edge', while some other work here might be characterised as experimental or speculative.

Typography as Interface

Following on from the last chapter, which focused primarily on typography as information content, with some reference to typography as navigation system, the chapter examines examples of practice where typography plays a major role in the interface representation and interactive experience of the content.

The growth of online software development and web applications has grown significantly in the last decade, particularly in areas such as productivity tools (figure 4.81), content aggregators (4.82), social media and communication (figure 4.83), data visualization (4.84), e-books (4.85) and latterly, mobile and tablet apps (4.86). The following images demonstrate how the role of typography has come to the fore as both interface and interactive content in much of this software.

Figure 4.81 *IfThatThenThis* web application for managing social media and content aggregators, *Visual Thesaurus* software application by Think Map Inc.

Figure 4.82 Content aggregators *Google Reader* and *Net Vibes.*

Figure 4.83 Social media and communications tool: *Twitter,* email (*Microsoft Outlook*) and text messaging.

Figure 4.84 Examples of typographic data visualization: *Twitter Spectrum* by Joe Clarke (Neoformix), *Wordle* and *Dream Tree* by ManyEyes, IBM's data visualization group.

Figure 4.85 E-book readers by Kindle and Sony, close-up of Sony book text and user interface overlays.

Figure 4.86 Tablet apps: *The Guardian* and *Flipboard* showing Twitter feed.

These examples demonstrate the volume of text on screens that we interact with on a daily basis, which according to industry predictions from Gartner (Minesi & Cozza, 2012) and Forrester (Gillet, 2012) is increasing rapidly with huge growth predicted for the use of screens (tablets) by 2016. It seems inevitable that screens will eventually replace paper as the dominant substrate for publishing and consuming text (Wisenbart, 2012). The role of design and typography will therefore naturally have increasing significance for how text is presented and interacted with on.

There is an interesting range of work called fantasy user interfaces (FUI's) that tries to visualise what software and screens will look like in the future. Most of the FUI work is created for use in science fiction films (see figures 4.87 and 4.88) or as promotional films portraying a vision of the future, by IT and telecommunications companies such as Microsoft (4.89), Gen-i, Alcatel-Lucent and Cisco (4.90), Vodafone and Google (figure 4.91).

Figure 4.87 FUIs in *World is Not Enough* (1999) designed by Mark Coleran, *Star Trek* Enterprise Ship LCARS interface, (1987) designed by Mike Okuda, *Lara Croft* (2001), and *Bourne Identity* (2002) both designed Mark Coleran.

Figure 4.88 *Iron Man 2* (2010) designed by Mason Nicholl (Creative Director and Designer) Ilya Abulhanov (Designer) at Prologue Pictures, and *Quantam of Solace* (2008) designed by MK12**.**

Figure 4.89 *Microsoft Future Vision: Productivity* (2009), movie designed and directed by Mason Nicholl (formerly of Digital Kitchen, and Prologue Pictures where he designed Iron Man 2 FUI) with animation by O Hello, Seattle.

Figure 4.90 *A Vision of Seamless Connectivity in the Future* (2011) by Gen-i in association with Alcatel-Lucent and Cisco.

Figure 4.91 Google's *Project Glass* (2012) demonstrates a first person augmented reality interface overlaid on the real world by wearing a pair of smart glasses and which driven by eye tracking and voice interaction (project release date is late 2013).

Examples of FUI's demonstrate a sophisticated future for screen typography that moves fluidly across any surface in response to human touch or voice-based interaction. This work suggests a typography that is native to the screen and which embodies screen properties such as 3D space, motion, time, sound and interactivity. It also suggests that practical principles from disciplines such as film-making, animation, information and interaction design are perhaps more relevant than those from traditional print typography. FUIs are interesting because in many cases they are based on technologies currently in development but which have not yet reached mainstream, and therefore have some basis in reality. For example, the gesture-based interaction in *Minority Report* (2002) became real with Microsoft's *Xbox Kinect* (2010). Other examples such as Microsoft's *Future Vision film* (2009) (figure 4.89) which shows interactive typography on any surface, will soon become reality with technology called *Sixth Sense* that is currently in development by Pattie Maes' Fluid Interfaces group at MIT (figure 4.92).

Figure 4.92 *Sixth Sense* (2009) developed by Pranav Mistry at Pattie Maes' Fluid Interfaces group at MIT.

The design principles used to create these examples of future user interfaces (FUIs) combine principles of motion (animation) and static/dynamic typography (information). The typography presented in FUI's is predominantly motion based information design that is highly functional and legible and combined with a high degree of data visualisation to show off its complexity. It also usually presents interactive paradigms based on via voice and gesture in spatial environment where the screen acts as an *augmented space* (see chapter 2).

These FUIs portray interactivity of the future but they are not interactive in reality, mostly, they are movie portrayals of interaction.

The principles of interactivity employed in the design of interactive typography, will be discussed in the following sections, which examine the practical output and methods used by some of the leading interactive designers that have emerged in the last two decades.

Research and Experimentation

There is a small but significant range of emergent experimental practice in screen typography, which as yet, is difficult to gauge in terms of its impact on mainstream practice. The selection of experimental work discussed here is created by a new breed of practitioners, unusually skilled (and sometimes formally trained) in both creative and technical areas. A complete review of educational programmes was outside the scope of this study, so this research focuses on a sample of emerging designer/programmers or artist/programmers who have recently gained notoriety for their work in screen typography, and which come from a small number of educational institutions with innovative curricula. Most notably, the examples discussed here blend technical and creative expertise but are firmly routed in a computer science background that brings a host of practices and principles relating to software development and human computer interaction that have not previously appeared relevant to the practice of typography.

The Aesthetics and Computing Group at MIT's Media Lab (1994-2003), renamed Physical Language Workshop (2003-2008) is particularly relevant to this research. Both groups were successors to the original Visible Language Workshop (1973-94), which was set up and directed by Muriel Cooper. She pioneered navigable and spatial typography in a time-based context through her experimental research into information landscapes (figure 4.93). Several of her students including David Small and Lisa Strausfeld (figure 4.94) have since gained notoriety for their contribution to information architecture, interaction and screen typography.

Figure 4.93 Stills from *Information Landscapes* presentation by Muriel Cooper at TED5, 1994.

Figure 4.94 *Financial Viewpoints* project of a 3D navigable spreadsheet by Lisa Strausfeld (1996).

In 1999, David Small, a student of Cooper's graduated with a PhD entitled *Rethinking the Book*. Small's work was revolutionary in that he tried to prototype a future vision of the digital book (*Talmud Project*) as a virtual three-dimensional space in which the reader navigated through the text. Combining passages from the *Torah* and the *Talmud*, in English and French translations, the software enabled viewers to manipulate blocks of text into the walls, streets and windows in an imaginary city of words (figure 4.95). Small also theoretically reasoned what guiding principles were needed to design and layout such three-dimensional interactive texts. He connected traditional methods of typography from print with techniques from screen disciplines such as film and animation and explored their application through computation. In Small's prototype of the screen book, the textual display immediately changes in response to the reader's actions with the mouse. Fluid transitions akin to film combined with the experience of using a first person perspective computer game create an entirely different type of reading on screen

Figure 4.95 Stills from *The Talmud Project*, PhD prototype (1999).

Text can be dynamically zoomed into extreme close-up, or viewed from a distance to see of the entire content of the work. The text is spatially organised in accordance with the semantic structure of the text so as the reader travels through the textual environment, the proximity and sequences of text blocks make sense.

Before Small, nobody had examined the implications for the formal arrangement of typography in a virtual space. Small identified a number of fundamental concerns for typography in such a screen context and devotes a chapter to each in his thesis, as follows:

- **form** – the visual presentation of typography on screen including: typeface, weight, spacing, setting, composition in 3D space, and screen specific properties such as focus, transparency, brightness, camera angle, zoom;

- **navigation and way-finding** – how to access different sections of a text and move through it using screen specific properties such as focus, transparency, brightness, zooming;

- **layering, juxtaposition and scale** – the use of the z-axis on screen to layer dynamic windows of text on top of each other and to scale them rapidly if required;

- **expressive movement** – use of naturalistic motion to move the text in response to user interaction;

- **tangible issues** – use of physical interfaces in conjunction with graphic user interfaces to deepen the interactive experience with information.

Small's bespoke prototype is programmed in C++ and Java and was in development long before animated vector software such as Flash came into mainstream use.

Many other practitioners since Small have since been examining the future of the book in digital form. Some of the most notable contributors include Bob Stein (founder of Voyager multimedia publishing company 1984) who founded the *Institute of the Future Book* in 2004 which created the *Sophie* project – an open source social reading platform, Craig Mod writer and designer of *Flipboard* fame, and Kevin Kelly, author and digital media critic, former editor of Wired. A more detailed discussion of e-book design and its significance for screen typography is discussed in the researcher's *Book 2.0* article (Kenna, 2012). Amongst the most innovative contemporary research in this area, is the work of Craig Tashman from the College of Computing at Georgia Tech, and his PhD project called example *LiquidText* (2011), a multi-touch text document manipulator (figure 4.96). Tashman is now heading up a start-up company that is developing *LiquidText* into a commercial product. *LiquidText* is highly significant from an interactive design perspective in relation to screen typography because it present a new form of interactive text document that enables the reader to physically interact with, move, link and annotate the text with their fingers.

Figure 4.96 Images from *LiquidText* (2011), a multi-touch document manipulation system that provides a uniquely flexible environment for active reading with interactive functionality such as highlight, annotate, flip between pages, compare documents, etc.

The design and typography of e-books and the future of digital books is a rapidly growing area of multidisciplinary research that combines editorial, business, technical and design concerns. It is beyond the scope of this research to examine it here, but is identified as another area for screen typography that warranted more detailed research in the future.

Returning to David Small, who set up Small Design after leaving MIT where, he continues to create innovative interactive information systems (for museums, exhibitions and interpretative centres) that 'invent new ways for people to read, interact with, and assimilate information' (Small, 2011). Small believes that designers need 'to rethink current design paradigms' because the computer screen is 'not a piece of paper and should not be treated as such' (figure 4.97).

Figure 4.97 Stills from Stream of Consciousness (1998).

Small's body of work remains substantially different to other practitioners in that most of his work is incorporates bespoke tangible interfaces for interpretative contexts in a physical environment. Two recent examples include an interactive fountain of quotations for the *Hall of Ideas* at The Mary

Baker Eddy Library for the Betterment of Humanity in Boston, and the 50-foot table touch-based interface for the Churchill Museum in London (figure 4.98).

Figure 4.98 Photographs of the *Churchill Lifeline* interactive table, Churchill Museum (2005).

These works are immersive typographic experiences that are beautiful to look at, to read and to feel. Without having Small's unique combination of creative and technological brilliance, and his ability to collaborate with others, it is difficult to imagine how such work could become within reach of mainstream typographic practice. However, Small's relevance to this research is in developing a set of core considerations for designing screen typography.

A number of other figures at MIT have also contributed significantly to the field of screen typography. The most famous of these is John Maeda. In 1994, following Cooper's death, Maeda, a young graphic designer and computer scientist (also a former student of Cooper's) took over the directorship. His early work in screen typography was truly groundbreaking, as nothing comparable had been previously produced. In 1995, Maeda created a series of 'Reactive Books' on CDROM. These essentially visual experiences respond to user input in real-time in a way that defies physics and are devoid of content. In one of the books, entitled *The Reactive Square*, (which was inspired by Malevich's red square) Maeda presented ten different squares that react to sound inputs made by the user. Maeda further developed this technique to create 'reactive typography' in works such as *Flying Letters* (1995) (figure 4.99), *12 o'clocks* (1996) and *Tap Type Write* (1998) (figure 4.100). These works represent a rare quality of combining clean elegant typography with the power of programming to create typography that reacts and renders on the fly according to the users actions.

Figure 4.99 Screenshots from *Flying Letters* (1995).

PhD Thesis: Chapter 4: Practice in Screen Typography © Hilary Kenna, 2012.

Figure 4.100 Screenshots from *Tap Type Write* (1998).

In 1997, Maeda created a series of interactive calendars for Shishedo (figure 4.101 and 4.102), which he admits were for 'purely aesthetic reasons' that were 'designed for you to waste time instead of save time'. These calendars are mesmerizing, in terms of pure cause and effect and from the scopophilic attraction of the typographic animations. Orbital loops of numbers can be drawn, rotated and scaled dynamically with the users mouse, clusters of numbers flow in swarms trailing the movement of the mouse around the screen or the timeline of a calendar can be zoomed from a year to hours in an instant. These interactive experiences, which are simple and instantly gratifying, are also beautiful to look at. Although the typography is dynamic, Maeda adheres to a reductionist aesthetic typical of a modernist palette. Maeda makes no secret of the modern influence in his work, he studied graphic design in Japan and acknowledges Ikko Tanaka and Paul Rand as key mentors.

Figure 4.101 Screenshots of Shisedo interactive calendars, *Line and Umi/Aki* (1997).

Figure 4.102 Screenshots of Shisedo interactive calendars, *Umi/Aki, Hanabi* and *Cosmos* (1997).

In 1997 Maeda taught a course in *Digital Typography* at MIT, which was based on his experimental practice in this area. Maeda was more interested in the possibility of what students could make using code rather than their technical acquisition of graphics programming skills. However, he soon found that the technical learning curve was steep for many creative students, and that it often became a barrier to their exploration. This problem motivated Maeda to develop DBN (Design By Numbers), a high level scripting language and environment created for visual designers and artists as an introduction to computational design and programming. The environment provides a unified space for writing and running programs and the language introduces the basic ideas of computer programming within the context of drawing. Maeda used the basic elements of form, dot, line and field combined with the computational ideas of variables, randomness and conditional statements to generate images.

From around 2000 onwards, John Maeda's work has become more experimental and self-expressive, focusing on fundamental interactions between form, colour, and computation. He moved away from using typography, and during a presentation at TED 2007, jokingly referring to himself 'as the guy who used to make flying letters'. He is now foremost an artist, and a designer and programmer second. His work continues to have international acclaim and he has exhibited all over the world. Maeda remains a champion of bridging the creative technical divide and believes that the quality of media art and design can only improve through establishing educational infrastructure in arts and technology schools that create strong, cross-disciplinary individuals (Maeda, August 2003). In January 2008, John Maeda left MIT to become president of Rhode Island School of Design (RISD) proving his commitment to this principle.

A number of outstanding students working in Maeda's group have since emerged as key practitioners in developing the field of screen typography. Ben Fry and Peter Cho are two examples, and both were also interviewed as part of this study. Fry and a classmate Casey Rheas (now also a widely acclaimed artist and educator) took Maeda's DBN as a starting point to further develop an open source programming language and environment called *Processing*. According to Fry, *Processing* was created to teach the fundamentals of computer programming within a visual context and to serve as a software sketchbook for artists and designers. *Processing* is for people 'who want to program images, animation, and interactions' (http://processing.org/). Fry has used Processing extensively for his own doctoral research experiments in data visualization and since graduation in his professional practice (figure 4.103). It is difficult to imagine how the computer generated typography in the variety of works using *Valence* (figure 4.104), could be realized using any other method. The elegant restraint and attention to detail in Fry's screen typography is perhaps evidence of his original training as a graphic designer.

> *I've been type obsessed since I was young, and typography was one of the primary reasons I studied as a graphic designer* (Fry, 2007).

Figure 4.103 Illustrations for article *Linkology*, New York Magazine (2006).

Figure 4.104 Variety of representations, built using *Valence,* which explore the structures and relationships inside very large sets of information.

Fry's interdisciplinary background may also explain his continued interest in design pedagogy as he regularly lectures internationally about *Processing's* potential offering to the discipline. Fry has recently written a book, *Visualising Data*, about the key stages of practice and principles required in data visualisation, an emerging field, which he sees as crossover territory between design and computation. Fry locates key data visualisation techniques and principles from the world of computer science (Shneiderman, 1987 & 1999) and re-presents them from a design perspective. Fry's contribution to the emerging field of screen typography is significant, through his own pioneering work and by his co-invention of a ne w tool for design practice (*Processing*), which he has made freely available.

I think it's important to have literacy with code... unless you can write a little code, you'll always be limited to the capabilities of tools that you're sold (Fry, 2007).

Processing has already made significant inroads into the design community where other such technologies had failed to grab the attention of traditional designers and typographers. In 2005, Fry and Reas were awarded the Interactive Design prize by the Tokyo Type Directors Club and in July 2007, AIGA's online journal featured an article *The Amazing Visual Language of Processing*.

Eye – the international review of graphic design, also published a feature article on *Processing: Grow Your Own* in the Autumn 2007 issue, which examines the current and future potential of *Processing* as a design tool. Fry and Reas have established a dedicated online resource for *Processing*, which has effectively become database of short programs (code samples), advanced libraries, documentation, and a gallery of current work made using the software. There is also a listing of courses in institutions around the world that are teaching Processing as part of their curriculum, among which are the MA's at the RCA and Ravensbourne in the UK. The open approach to the critical dissemination of *Processing* that Fry and Reas have established through *processing.org* has resulted in a growing community of new design practitioners with creative and technical fluency and an interest in experimentation.

Some of the examples in the Exhibition section of *processing.org* are astonishing for their unusual subject matter, technical innovation and unexpected visual outcomes. Examples such as Peter Cho's *Letter K* (figure 4.105) or Zach Libermann's *Kinetic Type,* represent a new kind of creative pursuit with letterforms. Letters and words can literally be 'peeled' from the surface of the screen into three-dimensional space. It seems that Processing can facilitate virtual manipulation and interaction right down to the fundamental level of the forms themselves. Using the power of programming algorithms and variables, designers can create infinite visual possibilities with *Processing* that would be near impossible to make using hand-based methods. The only limitation is our ability to conceptualise what to make with this technology and the technical ability to achieve it.

Peter Cho has created a substantial body of typographic experimentation using *Processing* which he currently showcases on a website called *TypoTopo 'the space where typography and topography overlap'.* For his Masters project (and thesis) entitled *Computational Models for Expressive Dimensional Typography,* Cho created a series of practical experimental works that explored different facets of spatial typography in the virtual environment of the screen. Continuing from his research, Cho collated some of this and other work in a site called *Letterscapes* (Figure 4.105), which received the 2002 Tokyo Type Directors Club Interactive Award and a silver award in 2002 from the Art Directors Club of NYC. The volume and variety of experiment in Cho's body of work and the fact he went on to complete an MFA in UCLA Design's department after MIT, demonstrates Cho's creative motivation and concern with exploring how 'craft' can apply to technology (Cho, 2006).

PhD Thesis: Chapter 4: Practice in Screen Typography © Hilary Kenna, 2012.

Figure 4.105 Screenshots from *Letterscapes* (2002).

The theoretical interests informing much of Cho's work deal with the boundaries between text and image and he is particularly interested in Johanna Drucker's work. Cho's experiments on *Typotopo* take up ideas concerned with the materiality of type (figure 4.106) and how to refigure them in the digital context (Marshall, 2007).

Figure 4.106 Screenshot of *Type me Type me not* (1998).

Cho seems less concerned about the critical analysis of his work in a research context than he is with the drive to keep making. He has taught at UCLA, Art Center Passadena and CalARTs and worked as a freelance designer. His output to date occupies a significant presence in the small canon of practical exemplars in screen typography. At the time of writing, Cho is Vice President of Design at Inkling, an interactive educational e-book publisher specialising in iPad books.

Designer/Artist Programmers

Data mining and information visualisation is another area where new forms of screen typography are emerging. Ben Fry's work has already been mentioned, but other artists such as Jonathan Harris and Marcos Wescamp are creating more idiosyncratic work.

Launched in May 2006, *We Feel Fine* (figure 4.107) by Jonathan Harris and Sepandar Kamvarthat gathers data, specifically about human feelings, from web blogs all over the Internet and uses computation to generate a series of playful interfaces visualising a random selection of these entries. The creators describe the work as 'an exploration of human emotion on a global scale using data gathered from blogs'. This digital artwork is yet another example of the inter-disciplinary collaboration that interactive digital media necessitates and affords. The technical prowess behind this piece is seemingly effortless, and the interface uses a graphic language more familiar to design than fine art. This piece has many of the characteristics of interactive digital typography. The typographic design is 'live', generated on the fly using computational code. Although this styling is pre-programmed, the contents are randomly grabbed from hyperspace. Thus, the real-time textual content keeps changing, and the typographic design must become an adaptable template to contain potentially any source. It is yet another example of the pervasive use and re-use of digital text on the web, where anything can be cut and pasted somewhere else in the 'continual loop of cultural production' (Manovich, 2002). Typographic design serves to facilitate and highlight this re-purposing. In the case of *We Feel Fine*, even the truth of the information is overshadowed by the power of the concept.

Figure 4.107 Screenshots from *We Feel Fine*, 2006.

In *We Feel Fine* traditional notions of time are challenged to create a new type of reading experience. The words appear when the reader interacts and in accordance with their selection, but they have no control over the content which is randomly drawn from up-to-the-minute or previously published posts from blogs in multiple geographic locations. This creates multiple readings and different experiences of the same emotion each time it is selected. In terms of current world events, it may even be possible to track the private feelings of the populous in a way that is not interpreted by more traditional media forms. *We Feel Fine* creates a sense of connection to something vast and abstract in a tangible inviting game like application and typography is the presentation vehicle for this experience. Its relevance to this research concerns the future possible contexts in which typography may operate, and how designers may have to invent typographic frameworks that are adaptable for unknown or changing content. This scenario differs significantly from traditional design contexts.

Marcos Wescamp's *Newsmap* (figure 4.108) is another piece of work that may be unconsciously breaking new ground in screen typography. It quickly found widespread acclaim when it launched on the web in 2004. *Newsmap* is an application that visually reflects the constantly changing landscape of the Google news aggregator by displaying and classifying headlines currently being reported in the news. It is based on a data visualisation algorithm called *Treemap*, developed by a leading veteran of human computer interaction, data visualisation and interface design, Ben Shneiderman. *Newsmap's* objective is to simply and visually demonstrate relationships between data and the unseen patterns of reportage in news media. Wescamp's original training as a graphic designer is evident in the typographic design and colour specifications that are programmed into the *Newsmap* display. The article headlines are rendered in a condensed bold weight in order to maximise legibility in the small amount of space available. There is also a logical (and harmonious) order of scale in the size of text headline relative to its importance and frequency of reportage.

Figure 4.108 Screenshot of *Newsmap (accessed 22.01.2008).*

Wescamp admits to being an interaction designer with a strong interest in information visualisation because it provides 'a little bit of every world, art, visual problem solving and

engineering' (Linderman, 2007). Wescamp also acknowledges the role of experimentation and paper-based sketching in realising his ideas before he begins writing code on the computer. While it is evident that typographic design is not a major focus of Wescamp's work per se, *Newsmap* is deserving of mention in the context of this research. The inherent nature of this work— programmatically generated typography displaying dynamic content from networked sources— signals innovative and complex future design contexts for typography called rich internet applications (RIAs). RIAs are one of the fastest growing areas of web development for which typography forms an integral part. Since creating Newsmap, Wescamp has worked at Adobe Research as an interaction designer before moving in 2010 to his current position as Head of Design at *Flipboard*.

Generative Graphics and Typography

In the mid 1990's, activity in the field of generative graphics and programmatic art began to grow significantly due to software such as Flash and later because of programming environments such as DBN and Processing. Graduates from Maeda's course such as Golan Levin and Josh Nimoy were widely published, although their work was more focused on abstract representation and sound than typography. Of the emerging 'Flash Generation', the experimental work of Yugo Nakamura, Hansol Huh, Jared Tarbell and Joshua Davis is distinguishable for its typographic aspects.

> *Collectively, these experiments are pointing the way toward a new screen aesthetic that depends as much upon our understanding of design history as upon our willingness to forego previous conclusions about that history in order to welcome what might be, at long last, a new avant-garde* (Jessica Helfand, 2001).

Lev Manovich has also compared the new media typography that has been emerging since the 1990's to the avant-garde and modernist practice of early twentieth century typography. He claims that software such as After Effects, Flash, JavaScript and Processing have effectively transformed media techniques (such as montage, the new typography, Moholy Nagy's new vision etc) developed during the avant-garde, into the conventions of modern human-computer interface. As a result, this software has enabled a multitude of contemporary practitioners to create experimental work, which according to Manovich reveals a renewed interest in modernist aesthetics.

Yugo Nakamura came to broader recognition in the western design community via an essay by Jessica Helfand, *Minimalism/Maximalism: The New Screen Aesthetic*, for Eye magazine. The essay is one of a series of essays about design for the screen, which Helfand later added to and published as a book in 2001. Nakamura describes himself as a 'creative director, designer and engineer exploring various forms of interactive system in digital and networked environment' (Nakamura, 2006). The dynamically changing subheading on the title of his website 'yugop is incubating ideas for...' is probably more revealing, as it oscillates between phrases such as 'accidental beauty', 'composition of motion logics', 'abstract communication', 'collaborative form', 'architecture for

diversity' and 'kinetic system'. Nakamura has housed his prolific collection of experimental work at yugop.com (versions 1 and 2, and monocrafts*) since 1998.

Figure 4.109 Screenshots of various experimental pieces from *monocrafts* and *yugop* archive (1997-2004).

It is possible to communicate the idea of this work (figure 4.109) through description but not the experience of interacting with these surprisingly sparse yet poetic pieces. These works are pure interaction, graphic elements, type and sound respond in unexpected ways to the users poking and prodding with the mouse. Graphics can grow and multiply, or shrink and disappear, type can swirl and follow the cursor in endless kinetic compositions. The screen space is in continual flux, perpetually redrawing itself in response to the users mouse movements. Navigation in the traditional sense of wayfinding is turned on its head in favour of pure exploration. The likelihood of repeating or finding the same thing twice may prove difficult. Yet despite all of this experimental interaction, the formal visual language that Nakamura employs is remarkably restrained. Helfand suggests this 'orderly, often monochromatic, geometric and spare' presentation is the new aesthetic of the screen, which she terms 'minimalism/maximalism'. The 'minimalism' refers to the palette of elements used and the 'maximalism' refers to the endless graphic freedom and interactive possibilities available in the realm of the screen.

Figure 4.110 Screenshot of *Yugop.com* archive interface.

Nakamura's work demonstrates traditional design principles applied through the refined graphic palette that he uses and formal compositions that he employs (figure 4.110). However, it is through the systematic kinetic transformation of these formal aspects and the unexpected interactive properties that they inherit integrated with a subtle use of spatial sound effects, that it is possible to glimpse an underlying design practice developed exclusively for screen. There are new design principles to be learnt from Nakamura's practice but for now they remain merely hinted at in the animated subtitle of his website 'reactive structure, composition for motion logic, collaborative form, abstract communication, accidental beauty, system for diversity' (yugop.com, 2007).

The experiments that Nakamura cultivated on *yugop* and *monocrafts* have since been adapted and applied elsewhere in commercial work for his substantive professional practice at *tha*. Nakamura founded *tha* in 2003 and has since created an unrivalled body of commercial innovative interactive work for screen (figures 4.111). Nakamura also continues to create a range of experimental artistic work for commission and for sale under *SCR*, a creative label he created for screen-based media artworks.

Figure 4.111 Examples of online work designed and develop by tha for Japanese company *Wonderwall Inc.*, *Industry Clock* installation for Vienna Airport design project called *ZeitRaum* by Ars Electronica FutureLab. and was installed at the new terminal of Vienna Airport. and Japanese clothing company *Uniqlo* (accessed 2012).

Nakamura's work has received numerous international accolades and has been exhibited in many of the world's leading cultural institutions (MoMA, Design Museum) and it is clear that Nakamura's double track approach to practice is mutually informative. His work is probably the most comprehensive example of how interactivity can be integrated with information to create immersive and beautiful typographic experiences. These experiences defy description and can really only be understood by interacting with them. A detailed formal analysis of the breadth and development of Nakamura's practice and his contribution to screen design and typography is perhaps worthy of an individual study.

There is no doubt that Flash has contributed to a developing a particular design and typographic aesthetic on screen. Perhaps because Flash is a vector-based application, abstract graphic form seems to be its natural output, and yet this does not explain the renewed modernist sensibility of much contemporary Flash work. Joshua Davis, an artist who began experimenting with Flash and programmatic art in the late nineties, created a website called *Praystation.com* in 1999. This website will probably remain in the history of web design as a landmark work, and certainly it launched Davis' career onto the world stage. *Praystation* showcases Davis' explorations into 'navigational structures, animation, sound, and programmatic application and implementation' (Davis, 2001).

Figure 4.112 Screenshot of *Praystation Version 3* (2001) interface and experimental study.

The design and interface of *Praystation* was remarkably elegant and restrained – using a combination of san serif typography (Arial), thin low-contrast rules, a monochromatic palette and ordered geometric layouts. The formal information design treatment of the interface created a sense that these artworks were being catalogued almost as scientific experiments (figure 4.112). Although *Praystation* was a gallery of experimental digital artworks (figure 4.113) created by an artist, the aesthetic and formal visual language used seemed to belong more to the discipline of design.

Figure 4.113 *Praystation Version 3* experimental studies of programmatic abstract form and interactivity (2001).

Without any formal training in typography or design, Davis unwittingly created a website with an aesthetic that resonated with traditional designers around the world and garnered widespread acclaim in design publications. In conversation with Davis after a presentation at the Darklight Festival in Dublin in 2001, I asked him about the design and typography of *Praystation* and whether any particular designers had influenced his work. He said that coming from a fine art background, he wasn't too familiar with designers' practice but that he wanted to keep the design 'clean and simple' and that his main influence was the American abstract expressionist painter Cy Twobly. He chose Arial because it was a web safe font (Kenna, 2001).

However, Davis pursued the exposure that *Praystation* attracted and he soon became a regular speaker on the international circuit of design conferences. He also promoted the Open-source movement and made some of his code freely available for download, which naturally led to all manner of imitation. For example, *Praystation's* horizontally scrolling image interface is now so commonplace that it is hard to appreciate it as a remarkable innovation in interface design at the time. Joshua Davis has probably had the biggest influence on mainstream website design that is built with Flash. The kinetic interfaces of Deepend and Group94 are examples of the new 'Flash Generation' of which Davis was an early pioneer.

Jared Tarbell is another artist who uses Flash to programmatically generate graphic artworks. He is also a major proponent of the Open source movement and provides many samples for download at his website *www.levitated.net*. Tarbell is also a computer scientist and even the language used on his site betrays his scientific background. He describes the contents of *Levitated* as 'visual poetry and science fun narrated in an object oriented graphic environment'. The gallery of samples at *Levitated* demonstrates a systematic body of experimental work based on the exploration of computer-generated form combined with the power of interactivity. Some of the work is reminiscent of Maeda's early reactive graphics. Tarbell's palette is also one of elemental form and some of the pieces resemble the basic design studies carried out at the Bauhaus, except in a screen based context. It is also clear from pieces such as *Golden Spiral* that Tarbell is interested in the underlying properties governing the organisation of visual form. Amongst the many examples, are a number of typographic or 'text-based' studies, three of which—*spherical text magnification*, *text*

space and *text tornado* (figure 4.114)—were published as 'systems of text display in the third dimension' in a book called *Flash MX 3D Cheats* in 2003.

Figure 4.114 Screenshots of experimental studies *on Levitated* (2003)*.*

Samples such as these have been adapted for use in contemporary mainstream practice. For example, the interface for the *Energy Ring*, at the *Fuelling the Future* exhibition in London's Science Museum, is based on Tarbell's *text space* sample. UK Designers Casson Mann and Soda Creative who designed the exhibition won a D&AD award for Outstanding Achievement and Exhibition Design in 2005 for this work.

Jared Tarbell is not a designer or a typographer and yet by making his experimental works freely available to others to build and develop, he is inadvertently contributing to the new typographic work being made in the mainstream. His seemingly scientific methodology and approach is ordered, incremental and coherent and a potential model to others wishing to engage in this type of practice.

Typography as software application and beyond the screen

To conclude this discussion, it should be stated that there are many other examples of interactive and experimental typography in a screen-based context. Application driven typography such as Hansol Huh's *Type Drawing* (figure 4.115), Nakamura's *amaztype* (4.115) or Erik Kastner's *Spell with Flickr* are all pieces of work that wed some aspect of typography with digital innovation on screen.

Figure 4.115 Screenshots from *TypeDrawing* web application (2005) by Hansol Huh and Yugo Nakamura's *amaztype* web application (2006)*.*

Each of these applications translates some aspect of typography or text into a mini-software application. Letter Error, a design company and type foundry in the Netherlands, have also been creating typographic related software for number of years including fonts such as *Beowolf*, and applications such as *RoboFab* and *Superpolator*. There are also, numerous other examples of installation based typographic artworks, that use projection and other types of screen displays, amongst which include Jeffrey Shaw's *Legible City* (figure 4.116), Camile Utterback's *Text Rain* (figure 4.117), Lisa Strausfeld's digital signage for the Bloomberg Offices in New York, the London Olympic stadium pixel animations (figure 4.118) created by the Chinese firm Crystal CG, and many more.

Figure 4.116 Jeffrey Shaw's *Legible City* was a virtual reality installation with a first person game like experience, which enabled the viewer to cycle through a 3D city rendered out of letterforms (1989).

Figure 4.117 Images from Camile Utterback's *Text Rain* of interactive typography that reacts to gestures made in front of the projected image.

Figure 4.118 Photograph showing song lyrics on the pixel display system installed on the audience seats during a performance by George Michael at the London Olympics stadium 2012, created by Chinese company Crystal CG.

PhD Thesis: Chapter 4: Practice in Screen Typography © Hilary Kenna, 2012.

These works move typography beyond the traditional screen into the spatial environment. This type of work is often highly complex in terms of its technological realisation, sometimes requiring bespoke hardware systems and large multi-disciplinary teams.

Detailed analysis of environmental screen typography is beyond the scope of this study, but presents another opportunity to extend this research in the future and to look at the emerging work by other researchers such as Barbara Brownie at the University of Hertfordshire (Brownie, 2012).

4.7 Findings from Interactive Typography

Interactive typography was perhaps the most difficult area of screen typography to assess because it appears heavily invested in technical areas of practice such as programming, software development, data visualisation and human computer interaction (called HCI in computer science). However, these highly technical disciplines have much to contribute to screen typography and upon further examination, revealed that the practical processes they employ in early stage conceptualisation and design development, have much in common with traditional design, albeit using a different vocabulary. Equally, there is clear evidence in computer science academic publishing that these areas have borrowed processes and methods from creative disciplines such as graphic design, animation and film. For example, conducting a search using keywords such as 'design', 'animation', and 'film' through the digital database of academic conference proceedings of CHI (biggest US research conference in HCI) or in the leading professional computing organisation ACM (Association of Computing Machinery) digital library, will turn up numerous peer-reviewed articles linking these creative disciplines with aspects of software design and development.

Another reason for the difficulty in assessing the design principles evident in interactive typography is the emergent nature of this work. Some of the leading examples of this work is not available to use (Small's *Talmud Project*, 1998), (Maeda's *Reactive Books* 1994), because of technical obsolescence or because it was originally developed on a bespoke technical platform. Other examples are scarcely documented or form part of a larger body of experimental work (Tarbel, 2004), (Nakamura's experiments on *yugop.com*, 1997-2004), (Davis experiments on *praystation.com*, 1999-2001). Most of the work presented in Part C: Interactive Typography in this thesis have not been critically reviewed or documented from a design perspective, and certainly not discussed together in a single analysis.

The following observations, which summarise the key findings from this area of practice, are also emergent and would benefit from even deeper analysis through primary interviews with the practitioners in conjunction with a more comprehensive examination of related academic literature from computer science sources. This was not achievable within the scope of this study, and

represents yet another aspect of screen typography that warrants further academic research which would make a critical contribution to understanding the field.

Key Observations on Interactive Typography Practice

- The most unusual and innovative screen typographic practice blends creative and technical expertise and is generally not made using the traditional creative directed then technically implemented process. In most cases, the designer is also the programmer (Small, Maeda, Fry, Cho, Davis, Wescamp, Nakamura, Tarbell etc).

- Many of the practitioners whose work is included here did not consciously apply traditional design principles in their work or have any formal training in typographic design. They made typographic design decisions based on intuitive aesthetic concerns or based on the limitations of the technology available.

- Much of the emerging screen work that has received notoriety for its technical prowess and interactive novelty, rather than for the quality of the actual typographic design.

- Theories and principles of practice from other screen-native technical fields such as computer science are especially evident in this area of screen typography. Different disciplines within the field of computer science such as human computer interaction (HCI), software development processes, computer programming, data visualisation and game design are particularly relevant.

- A core understanding of the nature of interactivity is critical to this area of practice.

- Interactivity and interaction design principles vary and have different emphasis depending on which discipline they come from. For example, game design considers high bandwidth interactivity where users are players and co-creators in narratives and environments where engagement (not usability) is paramount (Crawford, 2004), (Laurel 1996 & 1990). HCI on the other hand, largely focuses on productivity and usability models of interaction, which are based on cognitive psychology frameworks that are empirically tested (Pearce, ed. 1994), (Norman, 1988), Other user-interface guidelines from computer science areas which focus on information and data visualisation (Shneiderman, 1987 & 1999) are more concerned with information design principles and navigation rather than engaging gameplay or usability.

- Most contemporary publishing (Moggridge, 2006), (James-Garret, 2010), on interaction design comes from a hybrid perspective of influences combining aspects of HCI, game play (called gamification), information design and visualisation. Interaction design is commonly referred to as user experience (UX) design or user-centred design (UCD).

- New areas of programming, data processing and visualisation, as well as spatial and environmental concerns are emerging in contemporary practice. They will necessitate even

greater technical understanding of information systems and interactivity by designers in these spheres.

- Programming concepts such as randomness, variables, generative and multiple iterations are applicable to describing programmatically generated typographic work.

- The virtual z-dimension and the infinite canvass of screen typography is explored through 3D navigable text in many of the most innovative examples of contemporary interactive typography (Cooper, 1994), (Strausfeld, 1996), (Maeda, 1997), (Small, 1999),(Tashman, 2011). Zooming, layering, transparency and a first-person perspective (reminiscent of computer games) are key principles governing this type of interaction.

- Primary interactive game play concepts such as, cause and effect, is a key aspect of almost all work represented in this area of practice (Maeda, 1995, 1997, 1998, & 1999), (Cho, 2002), (Davis, various, 1999-2001), (Nakamura, 1997-2004). The text responds immediately to the users interactions and creates instant playful engagement between the text and the user.

- Practical methodologies and processes used in computer science, especially those from HCI and software development such as: user requirements gathering and analysis, personas, rapid prototyping, iterative testing and rebuilding, systematic version control and documentation are evidently used in areas of interactive typography that emanates from a predominantly technical. These methodologies are also evident in static/dynamic typography and as such might be describe screen native. They should be incorporated into the development of new methodologies for designing screen typography.

- There are many areas of interactive typography worthy of individual further study such as: typography in and as user-interfaces, typography in fantasy user interfaces and interactive typography in augmented space.

4.8 Summary of Findings from Practice Review

1.   The practice of typography in the screen environment varies greatly depending on the technology platform and context of use. It can range from static information typography on the web, to kinetic narrative typography on the cinema screen and a wide range of other applications in between. This makes it difficult to devise a singular definition of screen typography.

2.   However, it is possible to identify a common set of screen typographic properties that is evident in work across all three areas of practice including: motion typography, static/dynamic typography and interactive typography (figure 4.119).

Properties of Screen Typography
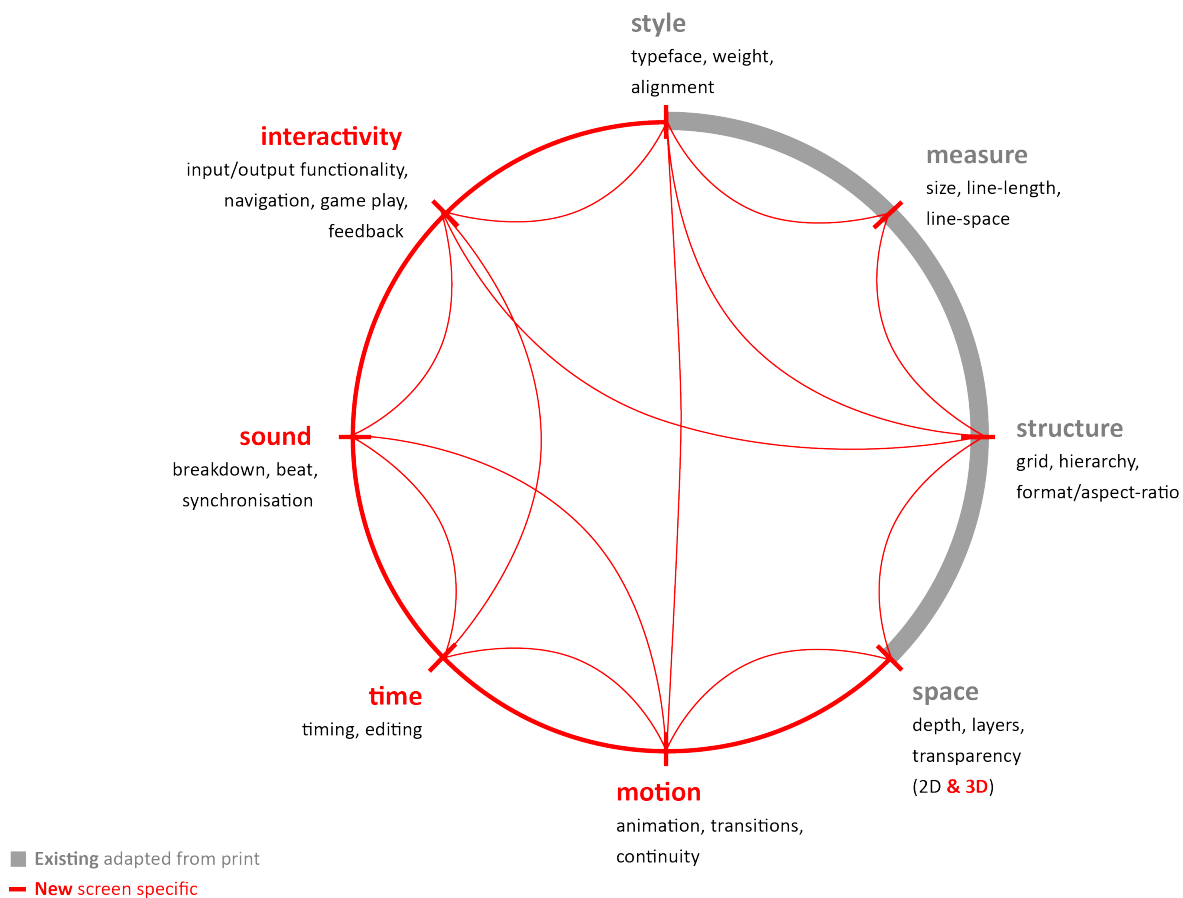
Figure 4.119 List of properties of screen typography. Seemingly simple, this diagram is the result of a distillation of findings in the research from Chapters 2, 3, 4 and their respective diagrams presented earlier. This diagram was also iterated and refined in conjunction with the later findings from Chapter 6 & 7 and the sequence of Ruder diagrams presented there. The typographic properties for screen typography are presented here in non-linear format with arcs linking the interdependencies between the different properties. For example, the property of motion may be intertwined with timing, and movement in space (2D, 3D).

3.   Much of what is hailed as new and innovative typography for screen is being made outside of the mainstream of the traditional typographic design field in areas such as education and research, self-authoring and self-promotion, art installations, and technical spheres that cross over into graphic design (e.g. multimedia programming, film-making, post-production and special effects, animation and even gaming).

4.   Types of work in screen typography are hard to classify, many examples don't fit neatly into one area, but crossover two or more categories (motion, static/dynamic, interactive).

5.   Each of the three areas of screen typography practice presented in this chapter in Part A, B, and C are large enough to warrant an individual study. They were very time-consuming and at times difficult to complete primarily because there were few precursors to refer to

PhD Thesis: Chapter 4: Practice in Screen Typography © Hilary Kenna, 2012.

and because the emergent nature of the work makes it difficult to critique in a broader context. Trying to survey the broad expanse of territory that this research covers proved at times a major stumbling block for this research. In hindsight, this chapter is too long and needs to be examined for alternative methods of presenting the journey of evidence that led to these findings.

6. Traditional design principles are relevant and applicable to all three areas of screen typography practice but do require some adaptation in the context of the screen. The nature of this adaptation depends on the type of screen and usage context in question.

7. Distinctive practical principles were identified in the three areas of practice for motion typography (see tables 4.1 & 4.2 and section 4.3), static/dynamic typography (see section 4.5) and interactive typography (see section 4.7). However, it is evident that much screen typography uses a mixture of principles from more than one area.

8. Screen native disciplines such as classical and experimental animation, film-making, motion graphics, web design, data visualisation, human computer interaction, user-experience design, game design and software engineering are the primary sources where new knowledge can be derived for screen typography design principles.

9. The majority of screen typography work is created by designers with multidisciplinary backgrounds that crossover technical and creative expertise.

The next chapter of this thesis presents a dramatic contrast in both the scale and scope of its focus when compared with this chapter. It is the result of critical reflection on the findings from chapter 2, chapter 3 and this chapter (4) in relation to the original research question, in order to find an appropriate research direction. It explains the rationale for choosing the methods and work of the modernist Swiss typographer and teacher Emil Ruder as a basis from which to build and extend an experimental practice methodology for screen typography, which is one of the main contributions of this research.

Chapter 5: Methodology

5.1 Background

After completing the critical review of the research context (documented in chapters 2, 3 and 4), it became evident that screen typography was a spectrum field, with vast and varied practices and types of output. The speed of technical change and the constant uncharted growth of new work being published in the field, presented a significant challenge for this research to make a sustainable contribution to knowledge. Evidence garnered thus far suggested that practical principles for designing screen typography were overshadowed by methods of technical production, which were in a continual state of flux and change with the introduction of each new technology. Critical reflection on the findings from the expansive discovery stage of this research (documented in chapters 2, 3 and 4) emphasised the need for a narrower critical focus that was design-led and independent of specific technology, if this research contribution was going to endure into the future. From this perspective, the analysis of existing typographic knowledge highlighted the work and methods of Emil Ruder as being distinctive for this very reason. The period of intense scrutiny on Ruder's work that followed is documented in this chapter, which details the rationale for why Ruder was selected and how his methods influenced the subsequent development of a practice methodology.

The move to focus on Ruder led to a turning point in this research, which is documented in the second half of this thesis. Chapter 6 explains how a detailed analysis of Ruder's methods and design principles were used as a starting point to develop an experimental practice methodology for screen typography. Chapter 7 discusses the subsequent testing and application of this methodology in practice, its evaluation through peer review and iteration based on the feedback. Chapter 8 outlines the conclusions drawn from the research and outlines its main contribution to practice in screen typography.

Emil Ruder and his Method

Emil Ruder (1914-1970) is distinguishable in the field of typography for developing a holistic approach to designing and teaching that comprised philosophy, theory and a systematic practical methodology. After twenty-five years of teaching, Ruder published a heavily illustrated book capturing his ideas, methods and approach. The book, *Typographie: A Manual for Design* (1967), represents a critical reflection on Ruder's teaching and practice and a life-time of accumulated knowledge. It has been published in nine languages and is now in its seventh edition. Today, more than forty years after this book was first published, it is still widely used and referenced by

education and industry practitioners alike (ATypI, 2004). The broad nature of this PhD research subject (design principles for screen typography) and the emergent nature of the field (screen typography) required a context review that encompassed a critical review of both relevant literature and contemporary practice.

During the analysis of findings from both the literature and practice reviews, Emil Ruder's practical methodology for designing typography emerged with particular relevance to this research. Four main reasons for Ruder's significance became apparent and form the basis of discussion in this paper, as follows:

1. The location of Ruder's book within the broader canon of literature on typography and design principles, and how it is referenced by and linked to the literature as a whole;

2. The distinctive nature of Ruder's book and practice methodology among the field;

3. The renewed interest in modernism, and how Ruder represents a paradigm of modernist aesthetics and methodology;

4. The relevance of Ruder's approach to screen media.

5.2 Ruder's location and links within Typography and Graphic Design Literature

The broad spectrum of literature related to the design practice of typography required careful analysis in order to select what material was relevant for the review. In doing this, a process of conceptual and visual mapping techniques became a key research methodology for editing, classifying, ordering, and analysing the seemingly broad range of typographic literature. After several iterations, the result of this methodology was a 'literature map' visualisation (see figure 5.1). It provides a chronological and contextual overview of the the relevant literature in the field from the beginning of the twentieth century. Criteria for inclusion is based on:

- relevance to category;

- established usage within education and course curricula;

- referral and recommendation on reading lists from educational and professional design organisations, and online resources;

- author reputation (as practitioner/educator/critic) and their bibliographic references;

- consumer popularity and contemporaneity;

- frequency of occurrence in any of the above.
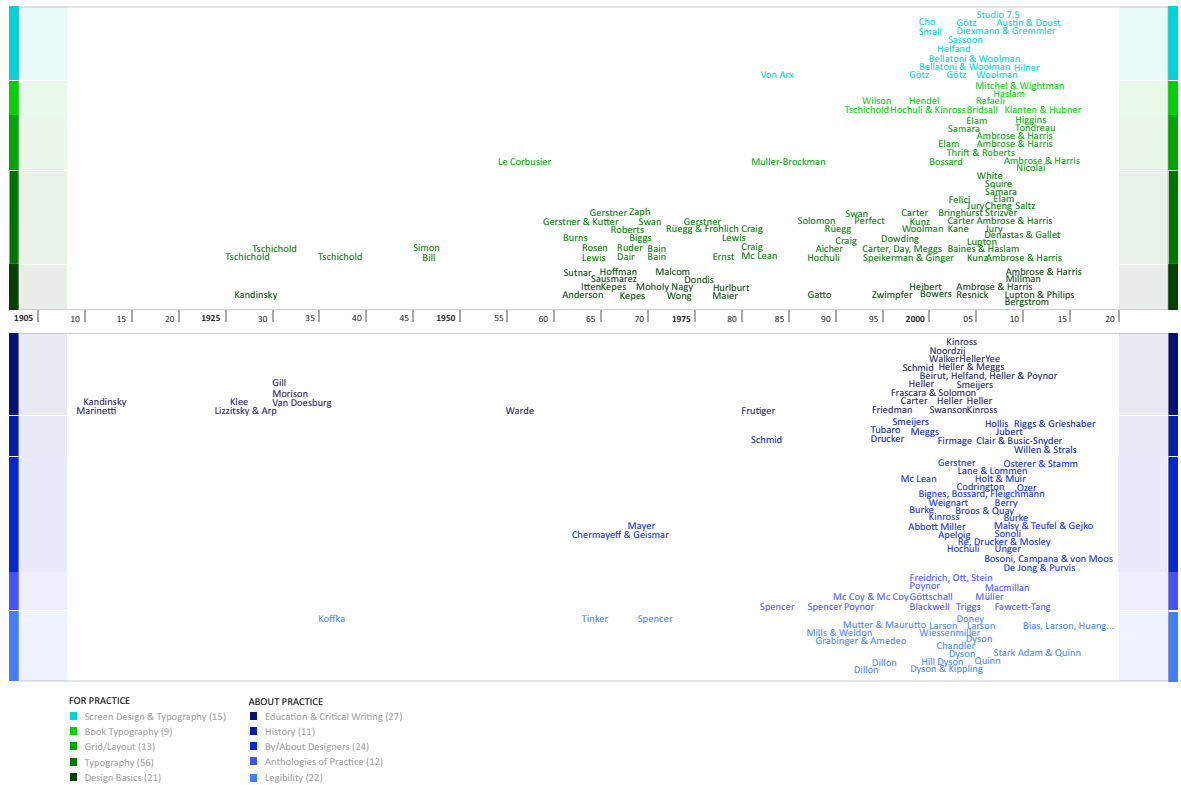
Figure 5.1 Literature Map.

The literature map illustrates the material split into two groups; *for practice* and *about practice*, with a further five categories in each group (see the key in figure 5.1). Through the visual display of these thematic groupings, it became easier to identify critical patterns within the literature that would have been more difficult to uncover using solely written methods. One such pattern was the dominant influence of Swiss typography in the literature.

At this point, it is important to note that while the literature map was very useful, it was not the only research methodology used in the literature review and that its limitations required other methods. For example, the literature map only displays book publications and not journal papers or articles (traditional or online versions), with the exception of the legibility category. This was mainly due to the diverse nature of such material and the difficulty in gauging its usage within mainstream practice. As a result, other methods including the use of RSS information feeds, content aggregators and authoring a research blog, were employed to track and analyse this type of literature.

The overall findings from the literature map combined with these other research methods revealed a number of critical directions for investigation, which led to the focus on Emil Ruder.

Findings revealed that the bulk of titles published about practical design principles for typography have occurred since 2000, and that the majority of these publications make reference to Ruder either within the text itself or in their selected bibliography.

This also prompted the realisation that a modernist legacy continues to underpin many of the contemporary publications on typographic design practice (Robin Kinross, David Jury, Phil Baines, Ellen Lupton, etc.), as well as exerting influence on the different and reactionary approaches (deconstruction, grunge graphics, postmodernism etc.) that emerged in the latter part of the twentieth century.

Visualising the literature has also helped to reveal significant connections between publications. For example, the dominant influence of Swiss typography in the literature was uncovered and connections between authors and subject matter are made visible (see figure 5.2).
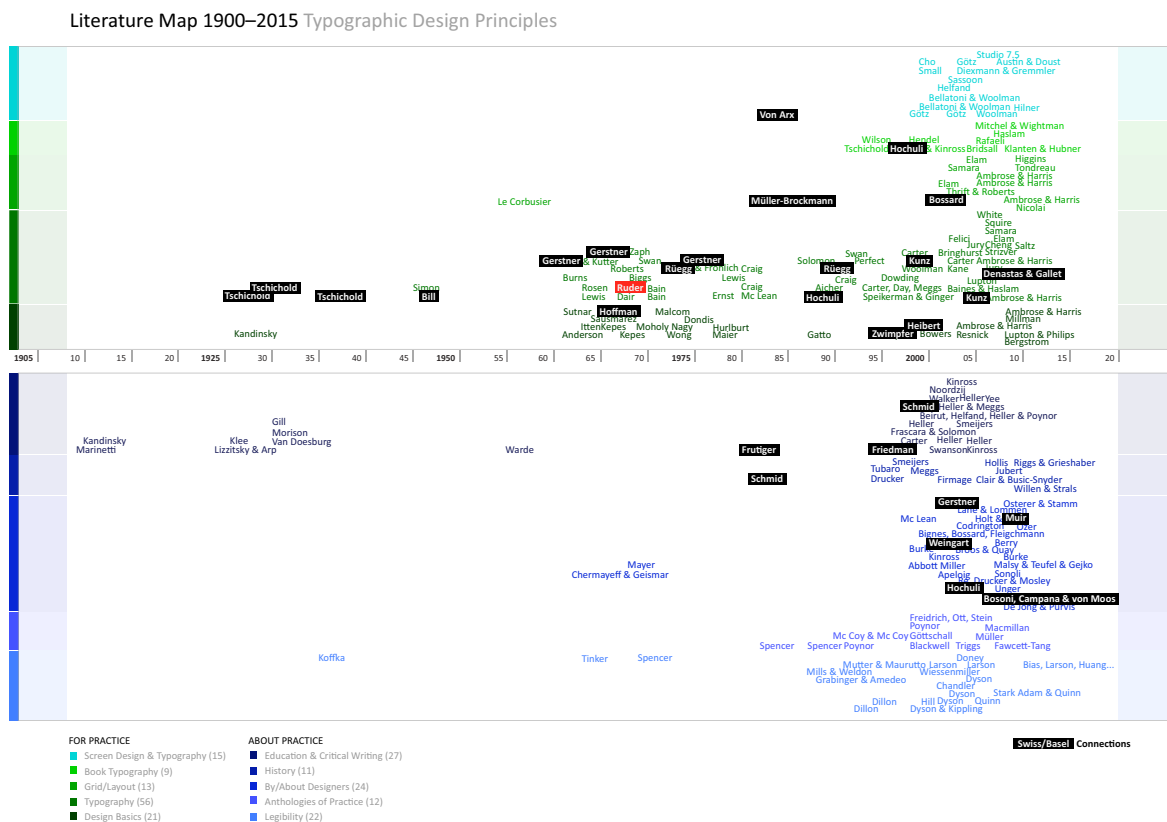
Figure 5.2 Literature Map with Swiss/Basel connections highlighted

A number of key publications chart the path of development of Swiss typography and the International style. First was Max Bill's publication *Über Typographie* (1946), which set out a number of principles for the new typography and around which a number of designers started to follow. The magazine *Neue Grafik (1958-65)* and the book *Die neue Grafik* (1959) by Karl Gerstner and Markus Kutter also spread awareness of Swiss typography to an international readership. Emil Ruder was a regular contributor to *Neue Grafik* and to another magazine *Typographische Mönasblatter.* Between 1959 and 1965 he published a series of articles about the underlying principles of his teaching and this new movement, which he called 'the typography of order' (Schmid, 1981). However, in 1961, Josef Müller-Brockman published a book, *The graphic artist and*

his design problems, which became a primary publication in the international dissemination of Swiss typography and its methods. Müller-Brockman detailed at length the core principles of this new 'graphic art', including:

- a striving for objective presentation through the elimination of decorative and expressive effects;

- an unadorned typography that clearly conveys the message to be communicated;

- the use of a grid for ordering the information and graphic elements;

- the restriction of type sizes and typefaces (san serif, because it was an 'expression of our age';

- unjustified text setting;

- the use of photography instead of illustration.

In his recent book, *Swiss Graphic Design: The Origins and Growth of an International Style 1920-196*5, Richard Hollis credits Müller-Brockman and Theo Balmer as having the prime influence on the development of Swiss graphic design. However, Kenneth Heibert (an ex-Yale design professor and colleague of Hollis), who was a student at Basel during the 1950's, strongly argues that Emil Ruder and Armin Hoffman's influence was of much greater significance and points to a number of inaccuracies in Hollis' chronology of development (Heibert, 2007). He claims that Müller-Brockman's own practice changed significantly towards the 'modernist' style for which he remains famous only after the hiring of graduates of the Basel school under Armin Hofmann in 1955. According to Heibert, this means that Hofmann and Ruder pre-date Müller-Brockman's mature style instead of being placed by Hollis as a separate and later development (Hollis, 2007, p.214).

Ruder's book *Typographie* is centrally located on the timeline of the literature map and although his book was not published until 1967, his influence extends earlier to 1942 when he began teaching at the Basel School of Design. As mentioned earlier, Ruder had been publishing shorter essays about his ideas and methodologies in *Typographische Monatsblätter (TM),* a Swiss journal of typography*,* from as early as 1944. His contributions to TM throughout the 40s, 50s and 60s were testing ground for much of the material, which would later appear in his book. In TM, Ruder's academic rebuttal of contemporaries such as Jan Tschichold, who favoured classical typography, and the passion of his arguments for all things modern including his promotion of Fruitger's typeface Univers soon established him as an opinion leader in Swiss typography. Armin Hoffman, director of the Basel School of Design during this time said of Ruder:

> *...he saw the return to classical form as a disastrous interruption of progress....one could say that the efforts of the Basel School...laid the foundation for a new typographic consciousness...* (Schmid, 2002).

By the time Ruder had published *Typographie* in 1967, his philosophy and methodologies were already internationally renowned within the field of typography (Schmid, 2009).

Highlighting titles on the literature map that are linked to modernist or Swiss typography (see figure 5.2) demonstrates a significant and widespread representation across the literature. The number of highlighted titles after Ruder, increase significantly. He can be linked to many authors and titles directly or indirectly, from a number of perspectives – including geographic location (Bill, Gerstner), through his teaching at Basel (Heibert, Kunz, Schmid, Weingart), as a work colleague (Hoffman, Von Arx, Frutiger), as a peer rival (Tschichold) or because his work was featured in their books (Hollis, Meggs, Schmid) . This web of connections presents a sketch of the broad sphere of influence of Swiss typography and the location of Ruder within it. The lineage from Ruder warrants more detailed study, but it is beyond the scope of this particular research. However, the widespread impact of the Basel School of Design and Swiss typography on the development of international typographic practice has been documented by other contemporary research, notably McCoy (2005), Hollis (2006), Heibert (2007) and Jobling & Crowley (1996).

The position of Ruder within the literature and the extensive links forward and backwards from him to other authors, as well as the prevalent use of Ruder's book today, provided the initial prompt to investigate his work and methodologies in more detail.

5.3 The Difference with Ruder

Another aspect of reviewing the selected literature focused on a critical comparison of their structure (including contents pages) and their approach to explaining the practical principles for designing typography. A large majority of the texts adopt a structure based on elemental aspects of typography such as letter, word, paragraph, etc. and a practical approach based primarily on technique-based rules of design relating to these elements (Ambrose & Harris (2006), Baines & Haslam (2002), Craig (1990), Jury (2006), Kane (2002), Lewis (1963), Lupton (2004), Mc Lean (1980), Rüegg, (1989)). These books also tend to chronologically separate historical aspects of typography from practical techniques and to place them into discreet chapters. This is a logical and structured approach that is both clear and understandable, but Ruder's presentation and schema is markedly different.

Ruder's book distinguishes itself from other titles for its thematic structure and philosophical approach. There are nineteen chapters in Ruder's book, each dedicated to a single concept or theme, such as; *form and function, form and counterform, contrast, rhythm, kinetics, variations*, etc. Each chapter begins with a critical contextual essay that encompasses references from a range of fields including art, architecture, music, Eastern philosophy and Japanese aesthetics, as well as graphic design and typography. Through diverse visual examples, Ruder manages to weave historical and theoretical aspects together with practical techniques and methodologies. The book is a dense mix of historical insight, Ruder's personal philosophy of design and textbook like instruction.

The overall effect results in a deep and layered argument, for a holistic approach to the practice of typographic design, that makes Ruder's book worthy of several readings.

There are other books that offer a philosophical approach to the practice of typography (Tschichold (1928), Bringhurst (2001), Kunz (1998)) but as the reader progresses through each book there is a separation between the philosophy of practice and the practical techniques. Ruder on the other hand continually relates the state of mind of the designer to both his ability to practice design and to acquire knowledge. There are also several contemporary publications by (and about) Helmut Schmid (Malsy, Teufel & Gejko (ed.), 2007), (Schmid 1997, 1981, 2009), a former student of Ruder's (from 1964-65), who has established himself as the guardian of Ruder's teaching legacy. Schmid continues to disseminate Ruder's philosophy and methods, and to demonstrate their contemporary relevance and usage in print typography.

What ultimately differentiates Ruder, from other treatises on the practice of typography is his holistic approach that combines a mix of pragmatism and poetry. He foregrounds design principles over techniques, emphasising a critical conceptual approach to practice that is underpinned by a systematic methodology. Similar to Eastern traditions of philosophy, Ruder endorses rigorous practice with basic elements first in order to gain mastery of the craft. Once this has been achieved, Ruder promotes a process of experimentation, which may ultimately lead to innovation. From a practice perspective, Ruder's book is less a manual of practical techniques and more a way of thinking and making typography as befits the purpose at hand. Finding and sustaining creative stimulus within the constraints of a given problem is paramount for Ruder. As a result, Ruder's methodology has a timeless quality, which may explain its continued relevance and appeal today.

In the context of screen typography, Ruder's approach is valuable because it operates at a conceptual level. It is not tied to any format or specific technology and is therefore sustainable. It offers a flexibility and openness that make it applicable no matter what changes and advances in technology affect the display and technical processes of producing screen typography.

In the next section this paper will examine why specific aspects of Ruder's methodology are particularly suited to designing typography on the screen.

5.4 Ruder – A Paradigm of Modernist Aesthetics and Methodology

The contemporary relevance of Ruder's work should also be viewed within the broader context of the last decade where there has been renewed interest in modernist design. Design critics, historians and media commentators cite various reasons for this resurgence.

According to Rick Poynor, at the height of post-modern experimentation in typography, some of its most ardent supporters like Rudy VanderLans in 1991, were questioning its future direction, considering 'the only way forward might be to go back' (Poynor, 2003). Other leading figures in post-modern typography had also begun to re-examine the values of 'design basics' in typographic

practice and teaching. Wolfgang Weingart (a Swiss designer and student of Ruder's), who had become disillusioned with the stylistic trend that his experimental work seemed to spawn, reportedly said to Helmut Schmid who came to visit him at Basel:

> *I do not know where we are going in typography. Maybe we will come back again to*
> *Ruder (Masly Teufel & Gejko, 2007, p.281).*

Weingart initiated a return to the famous 'Basics in Design and Typography Course' as a summer school at Basle in 2005, which proved highly popular and has been over-subscribed ever since.

Meanwhile, Katherine McCoy, an American designer and educator, credited with initiating some of the earliest postmodern approaches to typography, was also researching the impact of the Basel School of Design on U.S. typography. She traced the path of influence from Basel on American design education and typography in a paper *Another 60s revolution*, presented at the AIGA Educator's conference *Schools of Thought 2* in 2005. Mc Coy detailed how Swiss design education was brought to the U.S. at the Kansas City Art Institute 1964-1974 through the employment of three Basel graduates as teachers and how the resultant prevalence of modernist methodologies and approaches existed in those same schools during the 1960's. McCoy also uncovered a web of connections between graduates from Basel teaching in US design schools (Kenneth Heibert) and prominent American designers (Marlene McCarthy, April Greiman) who studied for a period at Basel.

Other commentators believe the congested information environment caused by digital technologies have created an overwhelming need for clarity and navigation (Wurman, 2000). In his book *Typography: Micro and Macro Aesthetics*, Willi Kunz (also a graduate of Basel) describes how modernist design principles can offer:

> *simple solutions that look fresh and unexpected in the visually chaotic environment of*
> *today* (Kunz, 1998).

Media theorist Lev Manovich, and design critic Jessica Helfand, meanwhile believe that developments in contemporary digital technologies are reminiscent of media techniques from the modernist era such as 'montage, Moholy Nagy's 'new vision', and Tschichold's 'new typography' (Manovich, 2002), and that they consequently lend themselves to modernist ideals and methodologies. Manovich and Helfand concur that contemporary practice in screen typography is embracing both strands of modernism,

> *the structural clarity of rational thinking and the capacity for inventive unorthodox (and*
> *often quite personal) expression...* (Helfand, 2001).

Findings from the critical review of contemporary practice undertaken for this PhD research - made it clear to see these strands of modernist activity at work in screen typography, especially in the work of the Yugop Nakamura, Peter Cho, Joshua Davis, David Small and John Maeda (see figures 5.3 - 5.9).

Figure 5.3 Screenshot of Yugop.com archive interface, by Yugo Nakamura

Figure 5.4 Screenshot of *Type me Type me not,* 1998, by Peter Cho.

Figure 5.5 Screenshots of *Praystation Version 3* experimental studies, by Joshua Davis

Figure 5.6 Still from *The Talmud Project*, PhD prototype, 1999, by David Small.
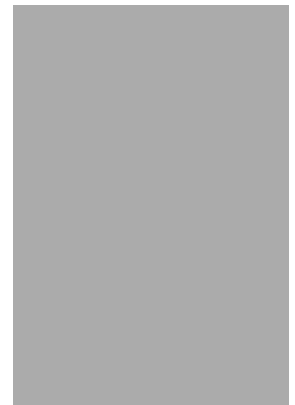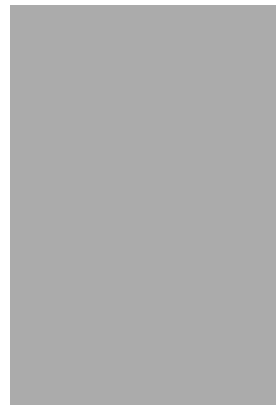
Figure 5.7 Stills from Stream of Consciousness, 1998 by David Small.

Figure 5.8 Screenshots from *Flying Letters*, 1995, by John Maeda.

Figure 5.9 Screenshots of Shisedo interactive calendars, *Line, Hanabi* and *Cosmos*, 1997, by John Maeda.

Other characteristics of the modernist period, such as those described by Paul Greenhalgh in his modernism 'feature list' (such as abstraction, technology, function, progress, etc.) are at least visually, if not conceptually, evident in other contemporary screen typography such as the work of Khoi Vihn, Ben Fry, Group94 (see figures 5.10–5.12).

Figure 5.10 Screenshots from *Subtraction* blog, by Khoi Vihn.

Figure 5.11 Variety of representations, built using *Valence,* which explore the structures and relationships inside very large sets of information, by Ben Fry.

Figure 5.12 Screenshots of Our Type Foundry website, designed by Group 94.

This overall context of a renewed interest in modernism helps to explain why Ruder's work appears relevant, from a methodological and aesthetic perspective, to contemporary screen typography and to this research. The need to focus on the underlying properties or 'poetics' of screen typography refined the aim of this research to examine design principles that incorporated not just rules, but methods for activating experimentation in order to explore the territory of the screen. Ruder's methodology offered both a means to learning the rules and to breaking them in order in an effort to strive for innovation.

The practice review also revealed that much of the innovative work in screen typography is experimental, emerging from outside mainstream practice, in the form of research-based or self-initiated projects by a new breed of programmers/artists.

This work is characterised by three things:

i)   new screen properties such as motion, 3D space, sound, and interactivity;

ii)   a systematic methodology of practice that is both rational and experimental and;

iii)   a minimal aesthetic palette.

Ruder's work seems to resonate on some level with all of these aspects.

Because much of the new screen work is technologically based, the mindset of its creators (many of whom are from technical backgrounds) is rooted in a scientific way of thinking where experiments are conducted so they can be proven to be repeatable and applicable in other contexts. The process is logical, incremental, documented and evaluated.

From a creative perspective the methodology may appear somewhat repressive, and yet this rational type of experimentation has yielded some of the most interesting and innovative work in screen typography (see the work of Maeda, Small, Fry, Cho, Nakamura, Davis, Tarbell). Ruder describes his methodology as:

> *… training in experimental typography, which involves the workshop becoming a laboratory and testing station, is more necessary than ever before if typography is not to congeal around principles that have long been recognised…* (Ruder, 1967).

Like Ruder, much of this contemporary work combines rational experimentation with minimal means, in an effort to extort maximum expression. Manovich describes it as:

> *'the rationality of modernism combined with the rationality of programming and the affect of computer games to create the new aesthetics of lightness, curiosity and intelligence'* (Manovich 2002).

Much of Ruder's teaching method is based on the rigorous study of elemental visual form (point, line, surface) through the making of a series of practical studies in composition for critical comparison. The work of Nakamura, Davis, Maeda and others could be viewed as digital equivalents – they use an economy of means (form, colour and type), to make experimental motion and interactive compositions on screen and catalogue their studies in a digital repository. Looking through their work, it is clear to see incremental progress through each iteration.

Helfand suggests that the collective experimental work of the likes of Nakamura and Davis, might be 'pointing the way toward a new screen aesthetic...a new avant garde' (Helfand, 2001).

Unfortunately, the appeal of minimal aesthetics has spread like a virus through contemporary practice, becoming more of a style and less of an approach to practice, based on modernist ideas. Internet technologies have facilitated an instant dissemination of modernist graphic design images more quickly that any other form of media.

There are numerous design blogs: www.swissmiss.com, www.swisslegacy.com, www.aisleone.com (see figure 5.13 & 5.14) and Flickr sites insect 54 (www.flickr.com/photos/insect54) and outofprint (www.flickr.com/photos/22309082@N07/) dedicated to modernist graphic design and typography, which are an instant visual reference available free to any interested party.

Figure 5.13 Screenshot of AisleOne design blog 2009, by Antonio Carusone.

Figure 5.14 Screenshot of The Grid System, an online resource for designers 2009, by Antonio Carusone.

Even though the widespread adoption of a minimal design style (for example, see www.smashing magazine.com online showcase of minimalist design examples and resources) may have started superficially, it has coincided with a resurgence of interest in the historical and theoretical work of modernist designers. The literature review findings reveal a large increase in publications about: modernist design principles revisited (Kunz, 1998, Bossard, 2000, Lupton & Philips, 2008, Schmid, 2009, Burrough & Mandiberg 2009); monographs about renowned modernist designers (Otl Aicher, Josef Müller-Brockman, Max Bill, Karl Gerstner, Max Huber etc.); and reprinted editions of classic modernist texts (Gerstner 2008, Hoffman 1988, Ruder 2001).

In this contemporary environment, Ruder's modernist methodology and aesthetics are not only valid and relevant, but valuable.

5.5 Ruder applied to screen media

As discussed earlier, Ruder's methodology is not specific to any technology nor is it led by technique. Rather it is driven by conceptual critical design principles grouped under themes such as *contrast, form and counterform, shades of grey, rhythm, kinetics* etc. (figure 5.15).
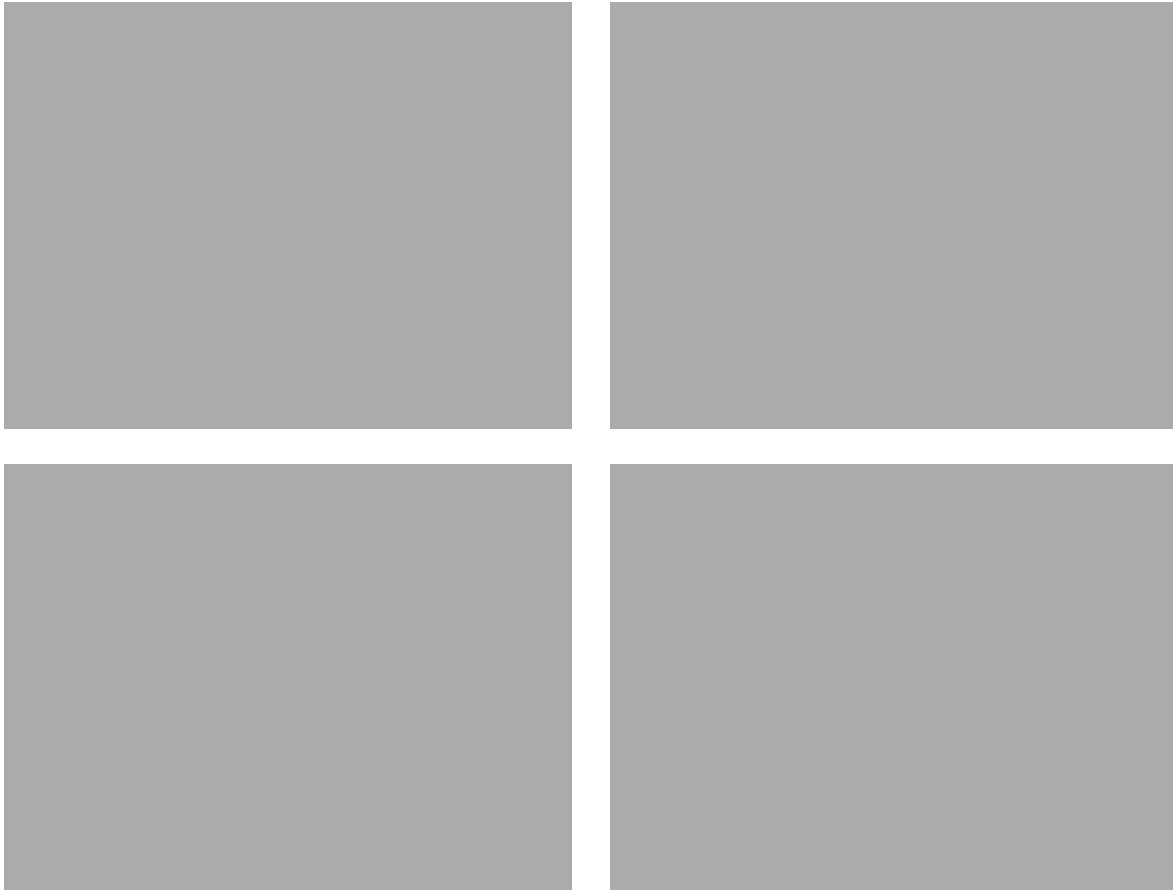
Figure 5.15 Examples of contrast, form and counterform, shades of grey, rhythm and kinetics from Emil Ruder's book Typographie, 1967.

At first glance, these themes seem transferrable to a screen context, and capable of being adapted to the new properties of screen typography such as 3D space, motion, sound and interactivity.

For example, *kinetics* and *rhythm* can be applied to the design of typography on screen that incorporates motion and sound. While Ruder discusses kinetics from the perspective of inferring motion on a page, his ideas can be translated to actual movement on screen.

Perhaps the proof of the applicability of Ruder's method to screen media is most evident in its influence on the film course at Basel (see chapter 2, p.171). Established in close collaboration with the Basel design course in 1968, the director of the film course, Peter Von Arx, was a colleague of Emil Ruder, Armin Hoffman and Wolfgang Weingart.

Von Arx integrated Ruder's design basics course into his course in Film Design, using a systematic methodology (used for typography) of breaking down the discipline into 'elementary phenomena

and dimensions' that needed to be fully understood before being applied in the context of design problems. Much of the course work output took the form of elemental design and typographic studies on film, based on a systematic exploration of key phenomena (mapped to Ruder's principles) such as image blending (*form and counterform*), time (*variations*), animation (*kinetics*), speed (*rhythm*) and composition within the camera frame (*arrangement, proportions, shades of grey*).

The results of Von Arx's systematic and principles-based approach are demonstrated in his book *Film Design* (Von Arx, 1983), which shows a range of film design exercises and visual studies based around the key phenomena mentioned above. The images of student work (see figure 5.16) and the selection of sample films (included on an accompanying cdrom) in Von Arx's book are remarkably contemporary, as they neither represent traditional live action or classical animation, but suggest the beginning of what we know today as motion graphics.
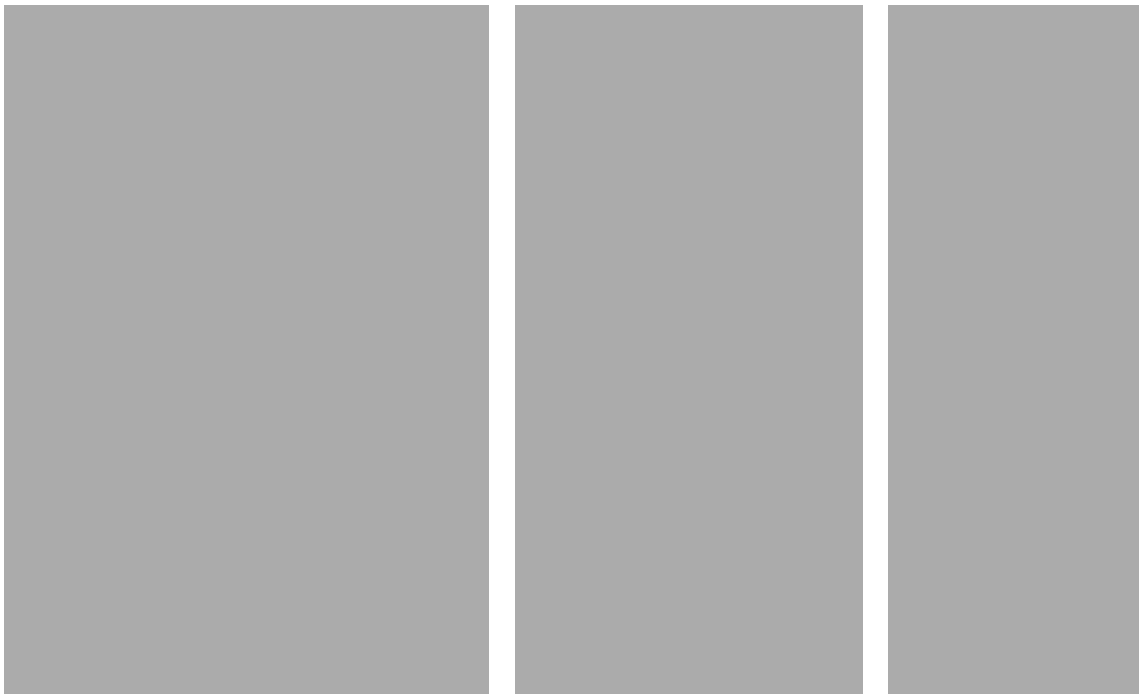
Figure 5.16 Student exercises from Peter Von Arx's class at Basel School of Design (Von Arx, 1983) demonstrating how Ruder's principles such as *form and counter-form*, *unity of form and function* (meaning) and *variations* were mapped onto basic visual design studies in film media. form,.

Some of Ruder's other themes also seem to suit the medium of the screen. The problem of composition in the virtual three dimensions of screen space necessitates the use of underlying grids to ensure not only consistency from screen to screen but an overall impression of rhythm in the sequence or layout. Ruder is renowned for his typography of *order*, and of *rhythm*. He used grids to create a system of order when arranging elements on a page, and rhythm to humanise the composition by varying type sizes, leading and line lengths. Ruder's mix of technical precision and poetic expression are fundamental to his philosophy. For him, excellent craft provides a license and basis for experimental interpretation. Other concepts that Ruder extols such as *integral design*,

recognise the need for formal unity in typography. When applied to screen typography, this easily translates into visual consistency, a key factor in designing user interfaces on screen. Equally, *shades of grey*, presents a fundamental principle for setting any body of text, whether on a page or on screen. It is especially relevant for screen typography because it creates a depth effect, which is an important consideration in legibility on screen, in motion graphics composition, and in the usability of dynamic interfaces. In web typography where there is generally a limitation of two typeface weights (regular and bold), achieving typographic texture or 'shades of grey' can be difficult and time consuming. However, the benefits to the form and function of the typography as explained by Ruder are worth pursuing despite technical limitations in production methods.

Also central to Ruder's methodology is critical reflection through comparison of multiple *variations* and iterations of the same elements. This ensures a design principle is fully understood and not applied as a once off success. This process maps appropriately to screen typography where digital tools can be easily manipulated to change a single parameter in order to render multiple variations of a single design idea. At the same time, the quick efficiencies offered by digital media can be detrimental to design because of the little effort required to manipulate type. Employing Ruder's method of critical and comparative analysis presents a qualitative intervention to evaluate the design.

The iterative nature of Ruder's methods, are similar to recognised contemporary design methods in the field of human computer interaction (HCI); such as rapid prototyping (Moggridge 2007) for user interface design, and the agile process (Agile Manifesto, 2001) used in software engineering. Some of the contemporary screen typographers discussed earlier, many of whom come from a computer science background, also use similar methods.

When considered in its entirety, Ruder's philosophy, conceptual design principles and systematic methodology, which incorporates experimentation, presents a unique model for practice in the field of typography. This research has identified Ruder as a worthwhile platform upon which to build a new practice methodology for screen typography. The following chapter charts the practical endeavor of this PhD research to critically analyse and practically explore how Ruder's methods and design principles could be extrapolated from his work and writings, to be applied, adapted, extended and transformed into a new practice model for designing screen typography.

Chapter 6: Practice Methodology

6.1 Evolving a Practice Matrix from Ruder

After establishing the rationale to focus on Ruder, a detailed critical analysis of his text *Typographie* began with regard to evolving a practice methodology for typography that could be adapted and applied to screen. In the course of this analysis, Ruder's other writing, particularly his articles for *Typographische Monatsblätter (TM),* were also incorporated and referenced. The aim of this chapter is to show how the critical distillation of Ruder's core ideas, were used as a platform upon which to build a practice methodology for screen typography. This chapter also provides evidence of part of the research contribution to the discipline and practice of graphic design. It also sets-up the parameters which led to the formulation of design principles that were applied and tested in both experimental work and a commercial project which are discussed in depth in Chapter 7.

After several readings of *Typographie*, conceptual mapping techniques were employed to visualise the critical and thematic strands within each of the nineteen chapters of the book. From this exercise, the following headings were derived as categories under which to group the chapters: *philosophy, design basics (laws of visual form), typographic properties* and *design principles* (see Table 6.1). Three additional headings: *history, criteria for good design* and *methods used,* were also considered as common themes running through the book which could also be incorporated into a new model for screen typography practice.

	Philosophy	Design Basics (Laws of Visual Form)	Typographic Design Properties (Values)	Design Principles
Chapter Title and number (order in book)	1. Introduction 2. Writing and Printing 5. The Techniques of Typography	7. Geometrical, Optical and Organic Aspects 9. Point, Line, Surface 19. Lettering and Illustration	1. Introduction 3. Function and Form 5. Techniques of Typography 12. Colour	4. Form and Counter Form 6. Arrangements 8. Proportions 10. Contrasts 11. Shades of Grey 13. Unity of Text and Form 14. Rhythm 15. Spontaneity and Fortuity 16. Integral Design* 17. Variations* 18. Kinetics
	also includes **History** and **Design Criteria**			**Methods*

Table 6.1 Chapters sorted under categories

The groupings in table 6.1 provided the basis for producing two key diagrams:

i)   Ruder Diagram 1 (figure 6.1) – an overview of the various facets of Ruder's practice
         methodology and how they are connected;

ii)   Ruder Diagram 2 (figure 6.3) – a detailed schematic of Ruder's methodology, that included
         a list of design basics, typographic properties and design principles.
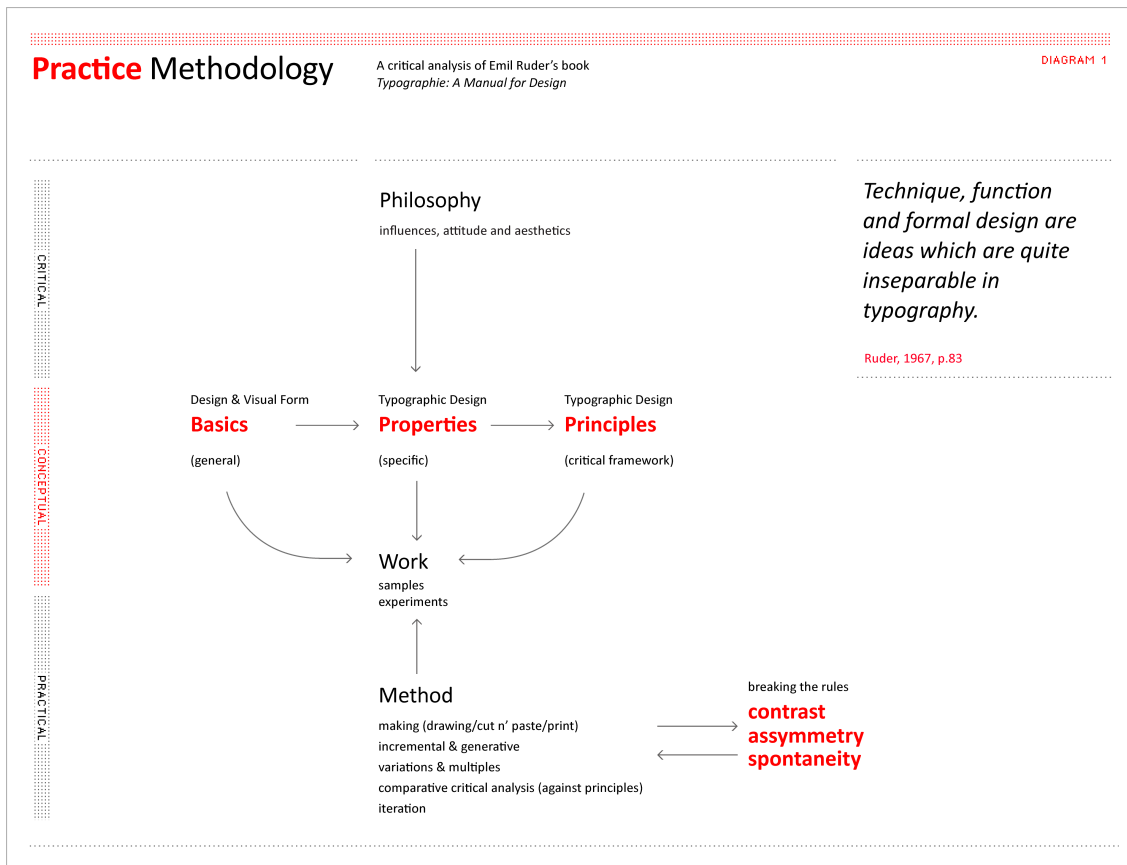
Figure 6.1 Ruder Diagram 1 – Overview of Ruder's practice methodology

The aim of Ruder Diagram 1 (figure 6.1) was to show the holistic nature of Ruder's methodology
and how it combined three aspects of practice:

• **critical** – philosophy and criteria for good design;

• **conceptual** – design properties and principles;

• **practical** – techniques and methods used.

It took several readings to uncover the relationship between these aspects, which were embedded
in the text. The use of visual methods made it easier to see the connections, and after multiple
iterations of the diagram, the core tenets of Ruder's methodology became apparent.

PhD Thesis: Chapter 6: Practice Methodology © Hilary Kenna, 2012.

The diagram also highlighted the conceptual nature of Ruder's methodology and its independence of any specific technologies. It showed that Ruder has ongoing relevance to this research where obsolescence is a key challenge in developing a practice methodology for screen. Ruder seemed to recognise that typography would always be influenced by whatever was the contemporary method of production, but that it had underlying design qualities that remained constant. This may explain why his book remains relevant and in common usage today.

> *But it (typography) has laws of its own, imposed by its technical nature, and these can and should preserve its identity even when it is closely bound up with other fields.*
> (Ruder, 1967, p.12)

The following discussion explains each facet of Ruder's practice methodology represented in Ruder Diagrams 1 and 2 (figures 6.1 & 6.3).

6.2 Philosophy and Criteria for Good Design

From the contextual analysis of Ruder's work in previous chapters, it was possible to identify how a core set of influences (that included modernism, Japanese culture and aesthetics, classical music, art and architecture) had informed his philosophy and criteria for good design practice.

Ruder's philosophy represents his viewpoint and attitude to design which is demonstrated through recurring beliefs and ideas that he promotes in the text of his book. For example, Ruder believed it was necessary to understand the craft of printing typography because of its direct impact on typographic properties. He used to carry a piece of lead type with him as a reminder that typography begins with a single letter, which is a small uniform printing block (Schmid, 2002).

> *It is in the unchanging appearance of all the letters that the beauty of typography resides and its essential nature lies in the repetition of the type characters and the repetition of the printing press.* (Ruder 1967, p.64)

While Ruder deemed that knowledge of past traditions was a prerequisite, he also felt advances in

> *...technology compels us to think afresh and calls for new forms as a living expression of the age in which we live.* (Ibid, p.10)

The tension between knowing and understanding the past while embracing the present and future is typical of the many seemingly contradictory beliefs that underpin Ruder's philosophy of practice.

Another such example is Ruder's emphasis on the modernist diktat that 'form follows function', which he asserts as a warning against poor design.

> *A printed work that cannot be read becomes a product without a purpose....No argument can absolve typography from this duty.* (Ibid, p.6)

He consistently underlines the need for designers to 'grasp the essential underlying laws of form' and for the 'proper observation' of principles as 'crucial for the beauty of a printed work and for its formal and functional qualities' (Ibid, p.108). However, at the same time Ruder states 'pure functionalism is not itself enough for good form' and is a strong advocate for experimentation as being critical to innovative practice (Ibid, p.34).

> *In designing composition, the typographer should examine every possible means of getting away from rigid systems and dull repetition, not merely for the sake of vitalising form, but also in the interests of legibility.* (Ibid, p.18)

Ruder believed that 'training in fantasy...to practice the elementary rules of typography without the bondage of aims', would 'stimulate and enrich every day typographic work' (Ruder, TM2, 1952). The trajectory of Ruder's contrasting arguments appear fundamental to understanding his practice philosophy and may derive from the combination of his affinity with Eastern traditions and modernist ideals. On the one hand, Ruder was fascinated with Japanese culture and aesthetics both for its criteria of beauty and harmony; and for its approach to artistic practice, which included repetition and critical reflection. He regularly cited Kakuzo Okakura's *The Book of Tea* (1906) during his classes at Basel and in his article *On Drinking Tea, Typography, Historicism, Symmetry and Asymmetry* in TM2 (1952), he sets out the relevance of Eastern thinking to modern typography.

On the other hand, Ruder also pursued modernist ideals of function, progress and technology (Greenhaugh 1997), with rational, systematic methods.

> *There must be no letting up in the determination to produce vital work reflecting the spirit of the times.* (Ibid, p.5)

Together, these influences appear key to the formation of Ruder's criteria for what is good and beautiful design, and his process of how to achieve them. Ruder's criteria are the tangible aesthetic qualities of a design composition that make it beautiful, but they are also measured in terms of meeting their functional requirements.

During the critical review of Ruder's text, the strongest recurrent themes about what constituted his view of good design were collated and distilled (after several iterations) into six core criteria. They are explained in the following table (table 6.2):

PhD Thesis: Chapter 6: Practice Methodology © Hilary Kenna, 2012.

Definition	Ruder Citation (from *Typographie*, 1967, unless otherwise specified)	Ruder Example
1. Objectivity		
The use of neutral visual means (sans-serif typography, abstract form, photography) for universal communication to ensure that meaning is not obscured by cultural associations with a particular typeface or by a designer's subjectivity.	...the printed letter...It is impersonal, neutral and objective by nature, and it is precisely these qualities which enable the typographer to use it universally and to vary his composition in a multitude of ways. (p.22) 'The typographer must be able to take the impersonal view; wilful individuality and emotion have little place in his work.' (p.8) 'The anonymous designers of such material have unwittingly created genuine period documents, which owe their beauty to their functional character.' (Ruder, 1960)	
2. Restraint		
The use of **minimal** means (visual palette) to achieve **maximum** effect (expressive communication). The concept of an **'economy of means'** is a recurring modernist theme also advocated by many other designers such as Gyorgy Kepes, Saul Bass, Paul Rand etc. The notion of restraint is central to Japanese aesthetics where it was thought **less is more**.	'...it is precisely the restriction of the means at his disposal and the practical aims he has to fulfil that make the charm of his craft.' (p.5) 'The sum total of all these prefabricated elements is so large that there is an almost infinite number of possible ways of arranging them in ever-new patterns. There can be no question of the typographer exhausting all the potential combinations.' (p.8)	
3. Contrast		
The use of **contrast** to create **tension** in all aspects of formal composition as a means to ensure dynamic, not static design. Combining contrasting values of visual elements should be carefully exercised to ensure that the overall uniformity remains unaffected.	'Combining two values in accordance with the laws of contrast changes and enhances the effect of both values' (p.132) 'the aesthetics and legibility of a typeface depend on the combination of contrasting forms...the relationship between the printed and the unprinted area must be one of tension, and this tension comes about through contrasts.' (p.132) ...he (the typographer) must know intuitively when the tension between several things is so great that harmony is endangered. But he must also know when to avoid relationships lacking in tension since these lead to monotony. (p.108)	
4. Rhythmic Order		
The application of systematic hierarchy for compositional, semantic and syntactic purposes. It should not be applied with rigid enforcement, but rather with variation and spontaneity to create a rhythmic consistency that avoids monotony. It includes the use of grids as well as proportional measure systems, for dividing up the page, arranging the elements and for specifying type sizes. Rhythm brings poetic expression and humanises otherwise mechanical tasks of order and precision.	'The advent of the machine has brought home to us again the value of a working rhythm.' (p.18) The machine determines the very nature of typography. The machine functions at its own even tempo; vital and individual rhythms are alien to it.' (p.186) 'A mass of type can be rhythmised by unequal leading, by variety in the length of the lines, by the white of blank spaces in break lines, and by grading the size of the type.' (p.186)	

5. **Asymmetry**		
The opposite of symmetrical and centred arrangements, in order to create active not passive composition. Asymmetry functions to assist legibility and to create arresting visual arrangements.	'...asymmetry is allied to the simple, the natural, and also to the freshness and to the highly imaginable...The path to centred setting is often the path of minimal resistance, because one shies away or does not master the requirements of good asymmetry.' (TM2, 1952) 'Yet it is asymmetry, which is the most effortless and congruous technique within typography. The beginning of the line is fixed, resulting in a width, which is determined by the number of letters and spaces, its end being determined by the right hand margin... ...how is one to read several centred lines? The eye needs to locate a new beginning for every line, making it more onerous to apprehend the text.' (TM6/7, 1959)	

6. **Empty space**		
The qualities of the space in which typographic elements exist is as important a design consideration as the element itself in the composition.	'The oriental philosophers hold that the essence of created form depends on empty space...contemporary typographers have long recognised the empty space of the unprinted surface to be an element of design...with white as a design value...'(p.16) 'In contemporary typography, white is not merely a passive background...there must be a parity between white space and typographical symbols as regards to the effects they produce on a given surface.' (p.52)	

Table 6.2 Ruder's criteria for good design

From the perspective of screen typography, Ruder's criteria seem applicable to the characteristics of the contemporary screen work identified in chapter 2 (see Maeda, Small, Fry, Cho, Nakamura, Davis, Tarbell) and reinforces the appropriateness of using Ruder as a platform to build upon.

The process required to meet Ruder's criteria is also derived from his eclectic influences. He promotes a staged process of learning that requires continual practice to acquire the necessary skills, which, when understood can then be critically applied. Eventually, this will lead to mastery of the craft, and in turn freedom for experimentation and innovation. This incremental approach to learning is influenced by Eastern traditions, where repetition of fundamental principles, were thought to lead to understanding and in time enlightenment. For Ruder, mastery could only occur when a student had reached a fluency in the fundamental principles of his craft, and to achieve fluency this meant 'working for years with painstaking attention to detail' (Ruder, TM6/7, 1960). The aim of Ruder's philosophy and criteria was to achieve functional yet poetic expression through a blend of pragmatic and precise methods.

6.3 Design Basics, Typographic Properties and Design Principles

The next part of Ruder Diagram 1 highlighted the conceptual aspect of Ruder's methodology, which includes design **basics**, **properties** and **principles**. The headings were eventually fixed on because they reflected stages in the journey of learning as Ruder describes it, from novice to master. These categories are explored more fully below.

Design Basics

Design **basics** are what Ruder refers to as the fundamental laws of visual form.

> *Contemporary typography is not based on the flush of inspiration and striking idea. It is based on the grasp of the essential underlying laws of form, on thinking in connected wholes...* (Ruder in Schmid, 2009, p.11)

These are essentially a set of rules governing how the use of form, colour, position and scale affects visual perception and our aesthetic sensibility. Two chapters, 7 (Geometrical, Optical and Organic Aspects) and 9 (Point, Line, Surface), are dedicated to a detailed explanation of these laws with step-by-step visual examples using abstract form, as well as a broad range of other visual references that include typography, painting, Japanese, prints and photographic examples from nature and architecture.
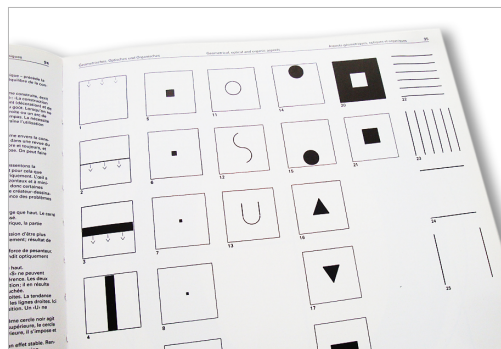
Figure 6.2 Page from chapter 7 (Geometrical, Optical and Organic Aspects) in Ruder's Typographie (1967)

The influence of early modernist and Bauhaus ideas about form are evident from Ruder's citations of Theo von Doesburg, Paul Klee and Wassily Kandinsky in these chapters. Another key influence was Armin Hoffman, with whom Ruder worked closely at Basel. Ruder ensured that Hoffman's course in Design Basics was a co-requisite to learning his course in typography.

> *A knowledge of formal problems is essential for true mastery...typography cannot be divorced from questions of pure form...*(Ruder in Schmid, 1981, p.52)

Ruder consistently emphasises the necessity for a designer to learn these 'basics', by rote if necessary, before engaging in the practical study of the design 'values' or visual 'properties' of

typography. Much of his book, *Typographie*, is written from the perspective that this training is a prerequisite. It is worth noting, that while design basics are widely recognised as an integral part of graphic design training, most of the contemporary literature does not align it so explicitly to learning typography. One notable exception is the work of Willi Kunz, who, as it happens, was also a student of Ruder's at Basel. Kunz, has since written two books on typography *Typography: Macro and Micro Aesthetics* (Kunz, 2004), and *Typography: Formation and Transformation* (Kunz, 2004) which incorporate design basics as central to learning design principles of for typography.

Typographic Properties

The **properties** or 'values' of typography as Ruder often refers to them, are the physical and visual attributes of typography that may be manipulated for functional and expressive purposes. They include; the visual qualities of the typeface, its weight, its size, the spacing between its letters, words and lines, and the spatial structure in which the typography exists (for example the 2D format of the page). Ruder Diagram 2 (figure 6.3) shows the full list of typographic properties, which according to Ruder required individual practical investigation, through a series of visual, studies in order to be understood.
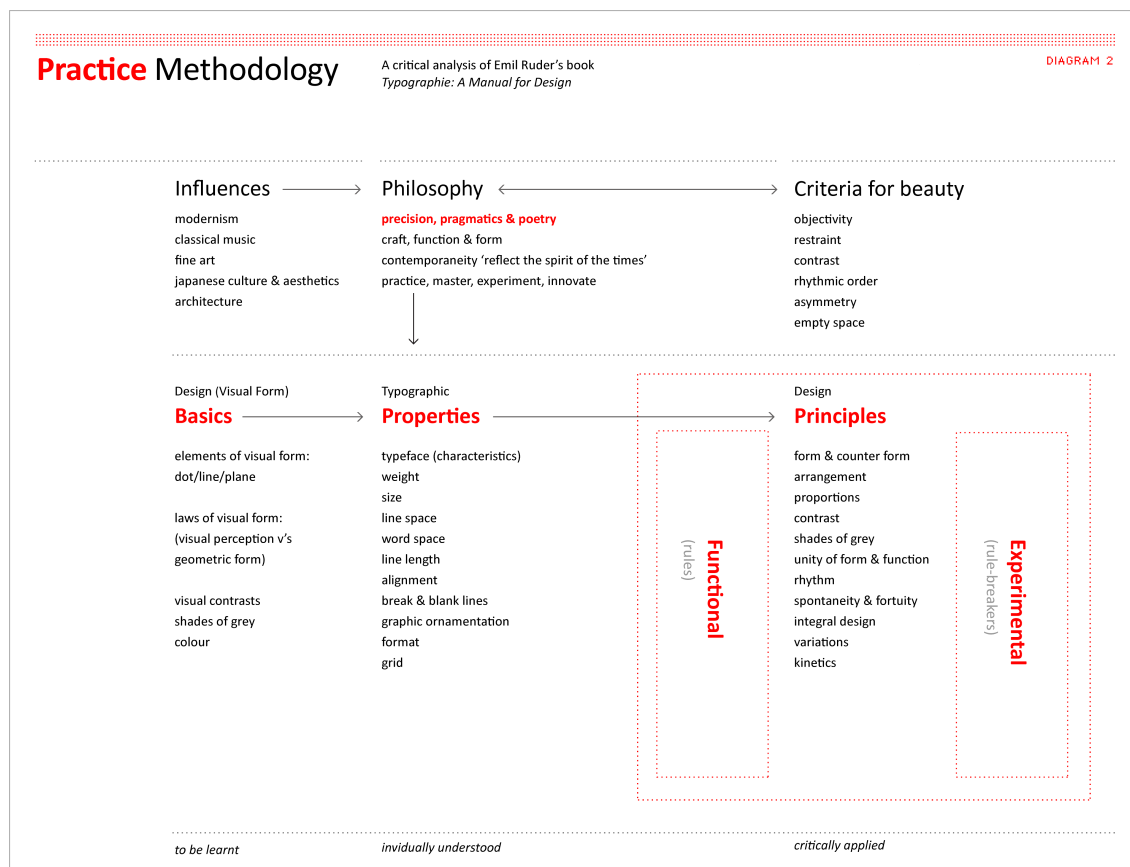
Figure 6.3 Ruder Diagram 2 – Detailed breakdown of Basics, Properties and Principles

In his classes, the process of practically working through each typographic property was repeated until an incremental understanding of each one and its inter-relationship with another, was achieved.

> *The spaces between words, and lines, which are of crucial importance for legibility are formal values which the typographer must keep in the front of his mind and use only after reflection. In every typographical work, even the most humdrum, this formal aspect cannot be neglected.* (Ruder 1967, p.34)

For the most part, Ruder's list of properties correlates with those in other treatises on the basics of typography (Baines, Bringhurst, Craig, Jury, Lupton, Kunz, Kane etc.). However, his methodology differs from other texts because he does not present them sequentially or base progressive learning on their chronological study. Instead, Ruder integrates them under his thematic design principles in a more holistic but equally systematic manner. Almost every chapter in Ruder's book provides a checklist and visual examples that demonstrate the nature of each property, starting with basic arrangements of form and building to more intricate compositions.
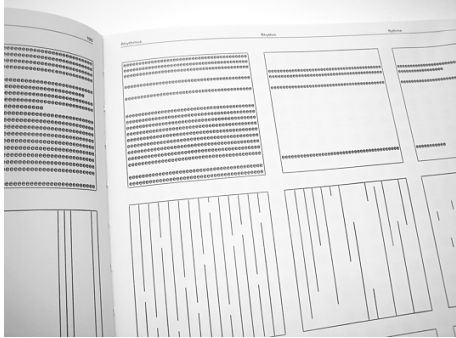
In the context of screen typography, Ruder's properties are relevant and extant, but they require further interpretation and adaptation for screen usage. Naturally, Ruder's list does not address the properties of screen typography such as; 3D, motion, sound and interactivity; which were identified in chapter 4. This research aims to address these gaps by extending and modifying the list of traditional properties into an appropriate new set for screen. Ruder's methodology provides a suitable basis from which to do this.
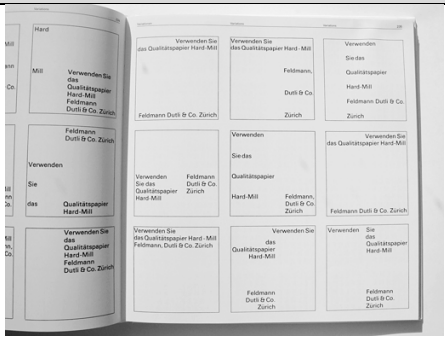
Design Principles
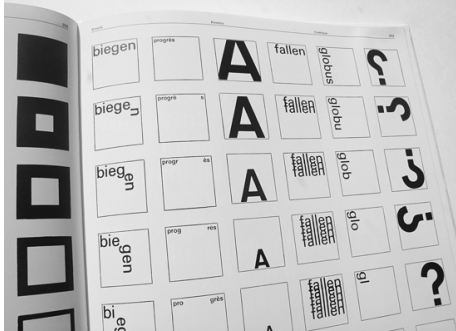
Ruder uses design **principles** to provide the conceptual basis for the visual interrogation of each typographic property, and for combining them together to determine the aesthetic and functional aspects of a typographic work. Ruder Diagram 2 (figure 6.3) records the inventory of Ruder's design principles, which are captured in eleven of the nineteen chapters in his book (see table 6.1). The following table provides a brief definition and example for each design principle taken from these chapters.

Definition	Ruder Citation	Ruder example
Form and Counterform		
Understanding the formal qualities and characteristics (shape, axes, curve, height, width etc.) of typographic form – from the individual letter to a mass of text. Awareness of the visual effect (shape and pattern) of positive and negatives spaces that determines by the interplay between the typographic forms and the background.	'The printed value evokes the its counter-value and the two together determine the overall form.' The space between the typographical symbols, become a field of forces whose invisible lines run crisscross between the printed elements. The ornamental power which may be inherent in the unprinted spaces must be detected and emphasised in full.' (p.52)	

Arrangement		
The placement and order of typographic elements on the surface to express hierarchical structure and meaning as well as aesthetic harmony in the visual composition.	'It is the typographer's task to divide up the page and organise and interpret the mass of printed matter in such a way that the reader will have a good chance of finding what is of interest to him.' 'A rigid, unrelieved area of composition without indents or break lines is a sign of professional immaturity and falls short of the desirable as regards both function and aesthetics.' The typographer must be conversant with them (laws of forms) and know how to use them, and one of the best ways of doing this is for him to imagine himself in the shoes of harassed reader…only then can he create printed works which will measure up to the highest standards as regards function and form.' (p.82)	
Proportions		
The system of measures or sizes used to divide the surface of the page and to determine the size of, and visual relationships between the typographic elements.	'Once a plurality of means is used, the real problem of proportion must be faced: the organisation of several things in a certain relationship of size'. 'Typographical design calls for the recognition of values which become visible during the setting process and have to be organised according to the following criteria: What is the relationship between one value and another? How is a given type size related to a second or third? What are the relations between the printed and unprinted areas? What is the relationship between the colour value and the quantity of grey of the type matter? How do the various tones of grey compare?' (p. 108)	
Contrasts		
The visual effect, created by the difference between two typographic properties, which serves to accentuate both and to create a more dynamic composition.	'Combining two values in accordance with the laws of contrast changes and enhances the effect of both values.' 'In combining contrasting values, care must be exercised that the uniform effect of the whole remains unaffected. If the contrasts are violent, such as light and excessively dark, or large and excessive small, one element can be so dominant that the balance between it and the contrasting value is upset or never comes into being at all.' (p.132)	

Shades of Grey		
The tonal range or 'colour' of typographic elements determined by the combination of: the characteristics of the typeface, the sizes used, the length of a line of text and the spacing between the words and lines.	'Before the grey effect is deciding upon, the typographer must be certain that the layout of his composition is functionally right.' 'There are as many depths as there are tones of grey; the white surfaces is broken up and riddles with illusions of depth.' The many tones of grey serve to articulate the diverse meanings in a large printed work but they can also be used formally when printing has to be evocative and dynamic.' (p.144)	
Unity of Text and Form		
The expressive interpretation of the meaning of the text through the visual form of the typography.	'The typographer must therefore strive to achieve harmony between the meaning of a word or words, and the typographical form in which he puts them.' 'Besides colour, the typographer has other means at his disposal for interpreting a text in visual terms: character and size of typeface, combination of different characters and sizes, letter spacing, the reversing and interchange of letters, deviations from the usual line of type, hand overprinting of certain characters in order to obtain a diffuse effect, deliberately defective and indirect printing with alterations obtained by chemical means, unusual imposition on the page etc.'	
Rhythm		
The manipulation of various typographic properties to create visual relief from the monotonous uniformity of machine rendered typographical form. Visual rhythm in a composition humanises the mechanical arrangement and display of typography.	'Lining up letters to form a word, a letter, a type area affords further opportunity for introducing rhythm'. 'A mass of type can be rhythmised by unequal leading, by variety in the length of the lines, by the white of blank spaces in break lines, and by grading the size of the type.' 'The width and height of the paper are part of the overall rhythmic pattern and the typographer can position word, line and type mass so as to be in or out of rhythm with the format.'(p.186)	

Spontaneity and Fortuity		
The role of chance, mistakes and playful techniques in creating typographic expression.	'Time and again, however we find printed works which make no claim to formal beauty and yet have a distinctive charm for all the technical shortcomings.' 'There are printed works which are beautiful solely because they set aside all ambition as regards technique and design and simply fulfil their function. Their usually names authors have unwittingly created true documents of their age whose charm lies precisely in their being a reflection of the times that produced them.' 'The latest technical developments in typography open up new possibilities for spontaneity and random effects.' (p.200)	
Integral Design		
Consistency in the choice of design format, arrangement of elements and typographic treatment that together signify formal unity within a single design piece or within a series of design works.	'Consistency in the business of printing is another modern requirement.' 'A book must be consistently designed throughout...The title page is taken as a model for all the others so that the typeface, type size, leading, indents, type area, blank spaces etc. fit into the overall pattern.' (p.214 'A book containing pictures and text based on a grid pattern of nine squares. This pattern is the mean's of establishing a formal unity between the amounts of text and different sizes and shapes of pictures. The pattern should not be conspicuous in the final result but rather concealed in the diversity of the pictorial subjects and typographical elements.' (p.226)	
Variations		
The use of variation within the constraints of a basic visual theme to create a range of different but unified visual compositions. It presents a broader opportunity to explore the visual expression of a text and to enhance its meaning through the visual form.	Variation involves change – the vitality of transformation, in contrast to constancy – the fixity of the invariable. In music variation means the mutation of a musical idea, the transformation of a them or a mean value.' 'Printing today calls for variation. Take a newspaper for instance. The same text appears time and again, but if a variety of typographical compositions are used, the reader will read the same text but at the same time his attention will be sharpened by constantly changing form. (p.232)	

280

Kinetics		
The arrangement of typographic elements in a composition or series of compositions to create visually dynamic patterns and the sense of movement.	'Runs of movement can embody the following themes: increase and decrease of value or increase and decrease of size; loosening up of compact elements and gathering together of scattered values into a compact form; eccentric and concentric movements; movements running from top to bottom and bottom to top; movements running left to right and right to left; movements from inside out and vice versa; movements along a diagonal line or through an angle etc.' 'The individual phases can be seized by the eye as a whole, opened singly as on the pages of a book or spaced out in time.' 'Thinking in movement phases trains our sense of movement on flat surfaces and in space and is indispensable for the creative work of our time.' (p.250)	

Table 6.3 Ruder's Design Principles

From close examination of his text, and consistent with his philosophy, Ruder's design principles appear to operate on two, often contradictory, levels.

Firstly, they act as a set of guidelines and techniques, or **rules** of best practice, that determine formal composition and legibility. In Ruder's book, clusters of rules are grouped under a thematic design principle and applied to specific typographic properties. The rules are definitive, and demonstrated by pragmatic instructions and examples about how best to apply his design principles to the properties of typography. According to Ruder, through his book he hopes to:

> ...elicit those strict and inherent laws of the craft of typography which wields such influence in determining the visual aspect of our world today. (Ibid, p.5)

The majority of typographic literature advocates the practice of design principles as rule based techniques, focused on the functional and technical aspects of typography that enhance the structure and legibility of a text. In the first interpretation of Ruder's design principles, he is not dissimilar. He also believed in the necessity of learning basic rules first, before delving into exploratory and experimental typography.

> The competent typographer will be able to master any job with these means. The full range of resources should be thoroughly familiar to him: type sizes, weights, widths and angles, typeface designs, rules, white space and colour. (Schmid, 1981, p.52)

When applied as rules, Ruder's design principles are closely tied to specific properties. Taking a closer look at any of the principles in the book will demonstrate this relationship. For example,

'Shades of Grey', or the 'typographic colour' of a text setting, is determined by the relationship between the x-height and weight of a typeface, with the length of a line and the space between the lines. Ruder showed the effect of manipulating these properties in the context of this principle through a series of visual examples.
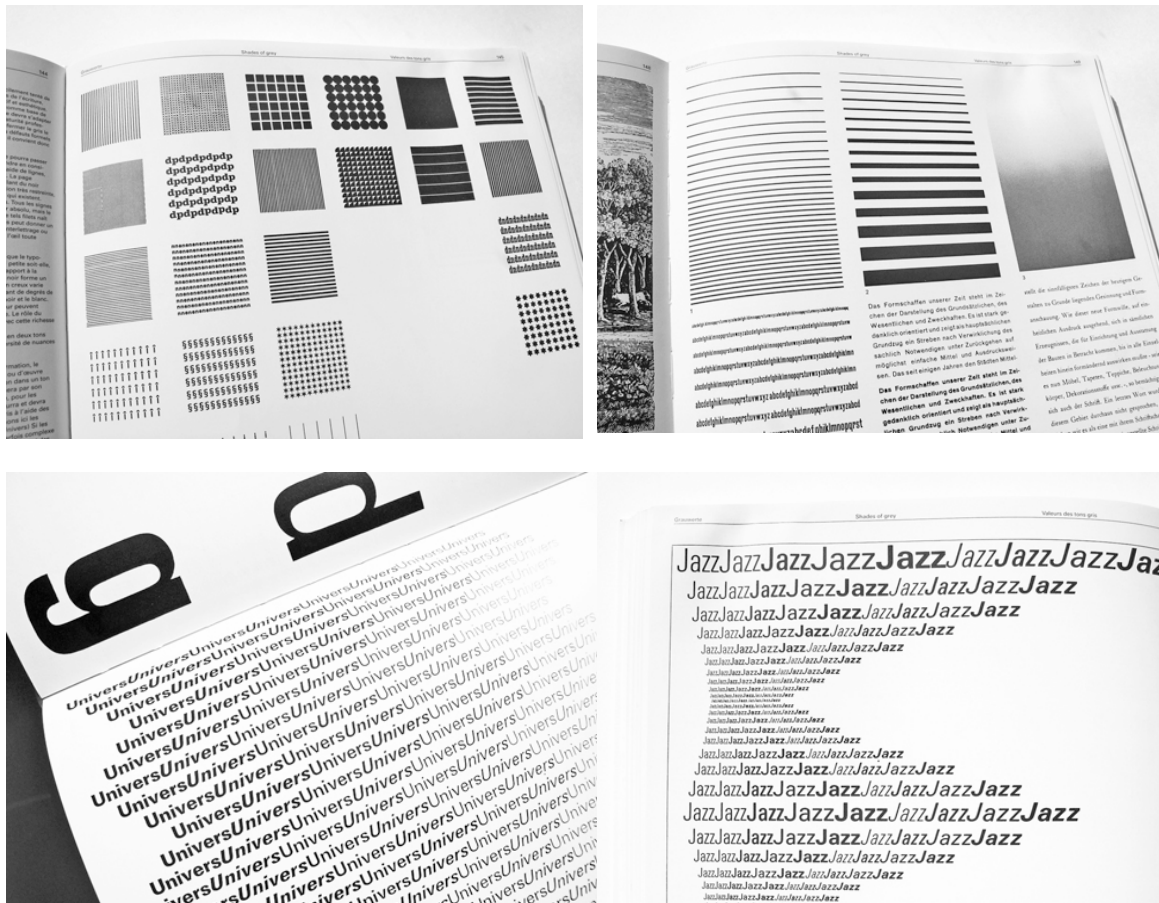
Figure 6.4 Ruder's Shades of Grey

For Ruder, the ultimate design task, was to create appropriate visual relationships between the properties and the principles in order to fulfil the practical aims of the work.

> *The well-trained typographer will devote equal effort to technical and aesthetic questions.* (Ibid, p.53)

This is the process Ruder uses throughout the book to explain the rules of applying each principle.

However, he also includes a broader explanation of the concept behind each principle through alternative visual examples from other fields of artistic practice, and through a critical essay at the beginning of each chapter.

It is this second interpretation of Ruder's design principles that distinguishes his methodology from the field, and the key reason he is referred to in the development of this research. Ruder's principles are thematic, and coupled with his design criteria and philosophy, they also serve as a set of governing ideas to activate creative expression, and to provide an axis of tension against which

to test the visual work. In this way, Ruder's principles function not only as a set of rules, but also as a set of ideas for breaking the rules to produce experimental and innovative work.

Helmut Schmid calls this aspect of Ruder's methodology 'typography from the inside', where an instinctive fluency of expertise emerges only after long hours of practiced study and reflection. This fluency of knowing the rules enables the move from following, to ultimately breaking them.

Wim Crouwel's essay, *Experimental typography and the need for the experiment* (1981), discusses how functional typography, based on methodical principles, can often lead to experimentation, driven by the need 'to improve typographical solutions'. Crouwel describes this type of work as somewhere between functional and experimental typography – 'partly functional and problem solving and partly close to self-expression'. He situates the work of Helmut Schmid and Wolfgang Weingart in this territory, both of who were students of Ruder, and who continue to practice and teach using his methods.

Approaching typography from the perspective of Ruder's themes can change what is a seemingly functional and mechanical task, into a creative, expressive endeavour. It is precisely the mix of both applications or interpretations of Ruder's principles that have ensured the continued relevance of his ideas and methods. The two sides to his methodology are what make it distinctive and responsible for producing typography that still appears 'modern and timeless' today (Schmid, 2009).

For this research, the dual approach to applying design principles – that combines form and function, with experimentation – became an important cornerstone in building a practice methodology for screen.

Practical Methods

In Ruder's class, students made systematic and rigorous visual studies of each typographic property, some of which are reproduced in his book. These studies comprised a series of variations using the same visual components, each with a slightly different emphasis depending on which property and design principle were employed. Ruder encouraged his students to print lines of type set in the composing room, then to cut and paste them into different arrangements on the page. This method instilled an understanding of the restrictions of the technology (lead type) and an appreciation for their creative manipulation using handmade techniques.

The resultant series of compositions were compared and evaluated against Ruder's criteria, then reworked and evaluated again. This iterative method of critical reflection and evaluation is congruent with Ruder's philosophy of practice. He believed that 'critical distance' was vital to students' understanding of the relationships between typographic properties and design principles. As far as he was concerned, training the eye and the mind to 'see' these relationships could only be achieved through internal critical reflection.

No system of ratios, however ingenious, can relieve the typographer of deciding how one value should relate to another. (Ruder, 1967, p.108)

Ruder's slow but progressive practical methods are clearly influenced by Eastern traditions as is his assertion for critical reflection. In his essay *On Drinking Tea, Typography, Historicism, Symmetry and Asymmetry*, he suggests that all artists use the same principles to:

...place elements on a surface, to make them harmonise and to relate them to a higher order. (Ruder, TM2, 1952)

From the perspective of contemporary practice, Ruder's practical methods maintain their 'modern' relevance. The value of 'cut and paste' methods is still widely advocated (Baines, Craig, Lupton etc.) in teaching and learning typography, although the use of digital technology has primarily replaced letterpress type. Critical reflection is also a broadly recognised technique within art and design education both in the form of personal critical reflection (Schön 1983), through a learning journal or as peer evaluation in 'group crit' sessions (Schön, 1985).

The iterative nature of Ruder's methods, are also similar to recognised contemporary design methods in the field of human computer interaction (HCI); such as rapid prototyping (Moggridge 2007) for user interface design, and the agile process (Agile Manifesto, 2001) used in software engineering. Some of the contemporary screen typographers discussed earlier (see chapter 4), many of whom come from a computer science background, also use similar methods.

To summarise, underpinning Ruder's systematic model for practice is a practical method that is incremental, iterative and critically reflective.

The diagrams became a central reference point in this research for developing the detail of the screen practice methodology to ensure it fit into a cyclical iterative process.

6.4 Drafting a Practice Matrix for Screen Typography

The next stage of development in this research was to determine whether the diagrams of Ruder's practice methodology could be adapted to screen typography and what, if any, gaps could be identified.

The first decision was to focus primarily on typographic properties and design principles for the screen. Design basics, while relevant, were deemed beyond the scope of the current study, but would provide a complementary area of investigation for future research. However, the need to look at incremental form as a means for building practice-based knowledge was addressed by adding typographic elements. In this way, individual elements of typographic form, such as letter, word, sentence, paragraph etc., could be examined using a step-by-step approach against relevant properties and principles.

PhD Thesis: Chapter 6: Practice Methodology © Hilary Kenna, 2012.

The first task was to incorporate the screen properties; 3D space, motion, sound and interactivity (from chapter 2); with Ruder's list. The chronological order of the new list was then examined in terms of its application to screen. The result was a condensed list, which incorporated some properties together (format and grid into 2D) and removed the less relevant ones (break and blank lines, graphic ornamentation). The new list was then divided into two;

- traditional properties, which could be adapted from their application in print and;

- screen properties, which required new definition.

The next step in adapting Ruder's methodology for screen usage was to examine the chronology of his principles and relate them to my interpretation of his three staged learning journey:

  i)   practice / learn;

  ii)   apply / know;

  iii)   master / experiment.

The principles were reordered, and in some cases renamed, to relate to these three stages of learning as follows:

Practice / Learn	Apply / Know	Master / Experiment
Form and Counterform	Contrast	Variations
Proportions	Rhythm	Spontaneity
Arrangement	Kinetics	
Shades of Grey	Integral Design	
	Unit of form and function	

Table 6.4 Stages of Learning and Design Principles

Gradually a new model of practice for screen, stemming from Ruder's methodology, began to emerge. The first draft is illustrated in Ruder Diagram 3 (figure 6.5) below.

Despite the chronology of a list-based presentation of the properties and principles, the concept of an iterative process was always paramount and Ruder Diagram 1 (figure 6.1) of Ruder's methodology was hugely influential in this regard. This viewpoint helps to explain how the idea for a practice matrix came about.

The idea of mixing and matching typographic properties with appropriate design principles seemed like an obvious method to use for a systematic practical study on screen. As the scope of demonstrating each property and principle for screen is too vast to complete within the extent of this research, choosing to create a representative sample from a matrix of these lists presented a realistic alternative. This approach was also non linear and provided a more open process, that could potentially be used by other designers in the future.
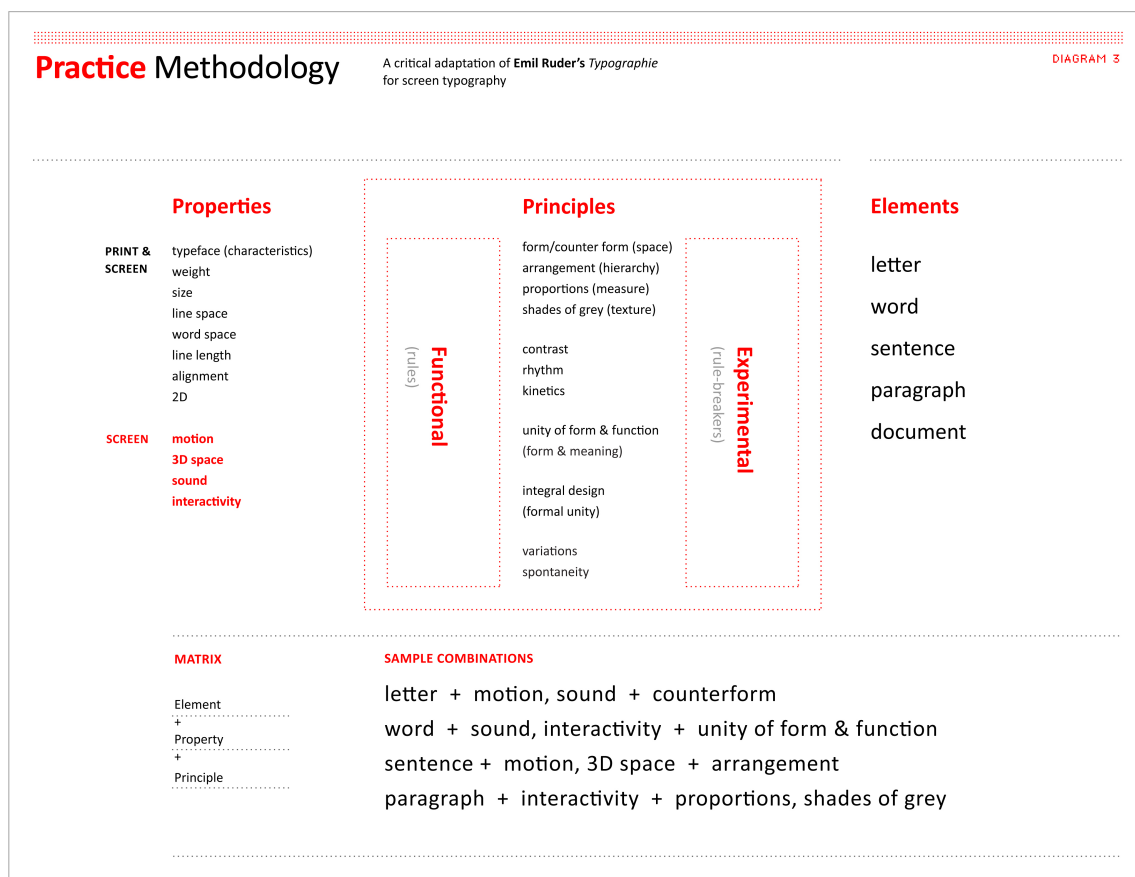
Figure 6.5 Ruder Diagram 3 – Practice Matrix for Screen Typography devised from critical adaptation of Ruder's methodology

The practice matrix for screen represented in Ruder Diagram 3 does not reference any specific technologies. It aims to be flexible and open enough for use within any technological environment of the screen. It focuses on the underlying properties of screen typography and on a set of conceptual design principles against which to visually interrogate and interpret these properties. Sample combinations, that include typographic elements, properties and design principles, are listed as building blocks that could be used in the practical application of this methodology.

Such examples will be used as the basis for creating a range of experimental samples as the practical outcome of this research and will be discussed in the next chapter. However, before using the matrix, further examination and evaluation of how the properties would be applied in a screen context was required.

The next stage in developing the matrix was to examine the properties in the context of Ruder's principles from two perspectives; firstly, as a rule-based technique with a functional emphasis; and secondly, from an experimental standpoint with an aesthetic emphasis.

The table below (table 6.5) was drawn up based on the list of new typography properties to explain how they are applied to screen as rules or techniques of best practice. This was informed by the findings and interviews from the literature and practice reviews in chapter 3 and 4, and by the researcher's professional knowledge and expertise which has been built up over 20 years from

diverse career experiences, that include graphic design print, multimedia development, web and UX design, teaching in a classical animation school and computer games development.

Table 6.5 (below) presents a draft lexicon of principles for screen typography, which attempts:

- to adapt and modify print typographic rules for screen usage and;

- to align relevant principles from other related screen areas (film making, animation, human computer interaction, etc.) to the list of screen properties devised in this research.

The reference listed, in the Design Rules column are primarily from literature sources in screen-native disciplines.

| Property | Design Principles | | |
	Design Rules (Techniques) (Formal / Functional)	Design Activators /Axes (Formal / Expressive)	Methods/Processes
Typeface	• Style & Characteristics • Designed for screen (web safe or other) • Low contrast strokes • Stems round to whole pixels • Horizontal curves • Strong joins • Horizontal and diagonal serifs • Large x-height (Tubaro & Tuburo, 1994), (Wade in Torre, 2005)	Form/Counter form Contrast	Paper and digital cut n' paste Variations (use of various digital tools)
Size	• Measure in pixels / ems • Three sizes for hierarchy • Fibonacci increments • Minimum of 11px for body text on screen (depends on typeface) (Dyson, 2002)	Arrangement Proportions Contrast Shades of Grey Rhythm	Paper and digital cut n' paste Variations
Weight	• Used for emphasis, hierarchy, interactive links. • Regular, Bold, Italic, Bold Italic, • Usually 2 weights for screen • Full family includes: light, regular, semi-bold, bold, black and italic version of each weight (Wade in Torre, 2005)	Arrangement Proportions Contrast Shades of Grey Rhythm	Paper and digital cut n' paste Variations
Letter & word space	• May need tighter kerning at display sizes • May need wider spacing for headings (Dyson, 2002), (Larson	Contrast Shades of Grey Rhythm	Paper and digital cut n' paste Variations
Line space	• Minimum should be type size + 3px more • Screen text needs generous line spacing for legibility and 'colour' of text • Baseline grid derivative of line spacing + type size (Dyson, 2001 & 2002)	Contrast Shades of Grey Rhythm	Paper and digital cut n' paste Variations

Line length	• Ideal for body text is 65-80 characters per line (Dyson, 2001)	Shades of Grey	
Alignment	• Left align, right rag • Right align, left rag • Centred • Justified	Arrangement Contrast Shades of Grey Rhythm	HTML/CSS tests Sample renders
Break & blank lines	• For paragraph breaks and to create space in text	Shades of Grey Rhythm	
Graphic ornamentation	• Rules, leaders, boxes, special characters etc. for emphasis and style	Shades of Grey Rhythm	
Format	• Screen aspect ratios (4:3, 16:9 etc) • Resolution (Vineyard, 2000)	Arrangement Proportions	Grid units and measure
2D space (include grids)	• Vertical and horizontal (baseline) pixel grids (ref 960) derived from content + type measure • Surface divisions: halves, thirds, focal points • Safe areas • Shot types and framing • Camera angles (Katz, 1991), (Block, 2008), (Diexmann & Gremmler 2003), (Vineyard, 2000), (Vinh, 2010)	Arrangement Proportions Rhythm Formal Unity	Thumbnail Paper mockup Photoshop mockup HTML/CSS wireframe Storyboard, shot list
3D space	• Stage Line & 180º rule spatial grammar for continuity • Staging and edgelessness • Camera movements • Layers (opacity, foreground, middle ground, background) • Space depth cues: perspective, distance, focus etc. (for deep /flat / limited / ambiguous space) • Lighting (Katz, 1991), (Block, 2008), (Diexmann & Gremmler 2003), (Vineyard, 2000)	Arrangement Proportions Contrast Shades of Grey Rhythm Formal Unity	Storyboard Animatic Motion test Wireframe
Motion	**Movement** • Line of action • Squash & stretch (weight & volume) • Anticipation / staging • Follow-through & Overlapping Action • Slow in / slow out • Arcs • Secondary Action • Timing • Exaggeration • Appeal (Johnson & Thomas, 1981), (Blair, 1994), (Wells, 1998), (Halas, 1987), (Griffiths,	Contrast Rhythm Texture Kinetics Spontaneity Formal Unity	Storyboard Animatic Motion test

	Timing	Texture	Editing – rough cut, first
	Timing • Frame rate / speed • Picture / sound synch • Duration • Accents • Beat • Counterpoint • **Editing** (Johnson & Thomas, 1981), (Katz, 1991), (Bordwell & Thomson, 1993), (Eisenstein, 1986)	Texture Rhythm Variations	**Editing** – rough cut, first edit, second edit, third edit, final cut.
Sound	• Synchronous (on the beat/exactly on action) • Asynchronous • Counterpoint • Accents • (Diegetic/non-diegetic) • Overlapping (Katz, 1991), (Bordwell & Thomson, 1993)	Contrast Rhythm	Breakdown chart/x-sheet Storyboard Animatic Motion test
Interactivity	Content Structure • Information design and visualisation • Narrative structures: linear, hierarchical, matrix, web, parallel etc. (Tufte, 1990, 1997 & 2001), (Fry, 2007), (Card, Mackinlay & Shneiderman, 1999), (Morville, 2006), (Mc Cloud, 1993), (Crawford, 2004), (Yau, 2011) Access • Navigation (global, local, primary, secondary, tertiary) • Consistency and standards • Usability/Legibility (Norman, 1984), (Neilsen, 2000), (Krug, 2005) Interaction/Experience? • Mapping to real world tasks • Cater for different levels • User control & freedom • Low mnemonic load • Exploratory/Play (Crawford, 2002), (Moggridge, 2008), (Shneiderman, 1987), (Saffer, 2009), (James-Garret, 2010) Feedback • Visual and aural cues • Informative feedback • Dialogs for closure • Error prevention • Reversal of actions • Reward • Help & documentation	Arrangement Proportions Contrast Shades of Grey Rhythm Spontaneity Integral Design Unity of form & function	Paper prototype Flowchart (structure + process flow) Dramatic Pitches Diagram Storyboard Wireframe Prototype – **Agile method** User centric Task driven output Short timescale release Iterative

	(Crawford, 2002), (Moggridge, 2008), (Shneiderman, 1987), (Saffer, 2009), (James-Garret, 2010) Other references that map across all aspects of interactivity include: (Kristof & Satra, 1993), (Shneiderman, Plaisant, Cohen, & Jabobs, 2009), (Neil & Scott, 2009), (Tiddwell, 2011)		

Table 6.5 Draft Lexicon of Principles for Screen Typography

6.5 Evaluation of the practice methodology and matrix

At this stage of developing the methodology for screen typography, external evaluation was deemed critical to validate the concepts and content within the proposed matrix.

The table above (table 6.5) and all of the Ruder Diagrams were validated, and presented for external evaluation and feedback using a number of methods. The main evaluation took place:

1. through a small series of targeted interviews with experienced practitioners from a diverse range of fields.

2. as a peer-reviewed paper presentation and as a workshop session at the 2010 annual international conference of the professional typography organisation ATypI (Association Typographique Internationale).

3. by applying the matrix in practice –
   – in research through the creation of a series of experimental studies published on the
     type4screen research site;
   – in education through presentation to students and lecturing staff on the
     Visual Communication programme at IADT (where the researcher works as a lecturer);
   – in professional practice during the design process of a commercial project,
     The Waste Land iPad App.

4. as a peer-reviewed journal article in *Book 2.0*, published by Intellect Publishing, which presented a critical discussion reviewing the design process of *The Waste Land App* and how the practice matrix was applied during its development.

This chapter has evidenced the appropriateness of using Emil Ruder's methods and design principles as a starting point from which to build a new practice methodology for screen typography. It has demonstrated how the proposed new methodology, called practice matrix, is not based on technical methods but rather on critical and conceptual design principles that will endure despite changes in underlying screen technologies.

The next chapter presents the different methods used to evaluate, apply and test the developed methodology in practice. Chapter 7 details how the practice matrix was presented for peer review through a series of interviews with experienced practitioners in a number of disciplines and at an international conference. It shows how the feedback received helped to further refine the methodology leading to the latest form of the practice matrix and draft lexicon of principles for screen typography. The second half of the chapter provides a detailed discussion of how the methodology was applied and tested in the researcher's practice as a series of experimental studies (*www.type4screen.com/practice*) and also to a commercial project – the design of *The Waste Land iPad App*, a full account of which can be found in Appendix III.

Chapter 7: Application and Evaluation of Practice Methodology

7.1 Evaluation of Practice Methodology

The first part of this chapter sets out the methods used to evaluate the *Practice Matrix* through peer review in the form of a set of detailed interviews with expert practitioners; and presentation at the international annual conference of Alliance Typographique Internationale (ATypI) in 2010. The second half of the chapter gives an account of how the developed methodology was tested and applied in practice as a range of experimental studies (*www.type4screen.com/practice*) to elements of typography such as letter, word sentence etc., and to the design process of a commercial project, *The Waste Land iPad app,* which represents a full-text in the form of an e-book. Together, the combination of practical outcomes, provide solid evidence of testing the application of the methodology in practice. The findings of this testing indicates the potential of the *Practice Matrix* to be applied to wider educational and professional contexts in the future.

Rationale

A focused qualitative methodology, which took the form of a small number of 'expert interviews' (Brown, 2009) with experienced practitioners, was used to gain initial feedback on the *Practice Matrix*. This method was critically chosen as part of a systematic process over other qualitative methods such as surveying and focus groups because this research required consultation and feedback from a wide range of related disciplines. These disciplines which include: graphic design and typography, web design and development, interaction/user experience (UX) design, animation, film, motion graphics, human computer interaction (HCI), art and design education; were critically identified in the context review of screen media and technologies in chapter 2.

It was deemed that interviews with carefully selected experts (see tables 7.1 and 7.2) in some of the identified disciplines would strategically cover the expanse of required expertise and yield a focused and informed response to this specific research.

Survey methods were deemed not to be of greatest evaluative value in this case, especially because of their traditionally low response rate and the difficulty in ascertaining a consistent baseline level of knowledge and experience in the respondent group. Focus groups, on the other hand, which may be carefully selected, were also deemed unfeasible for this research because of the interdisciplinary range of expertise required and the availability of such a disparate group of experts in one location at the same time. In addition, participants are often less forthcoming with their responses in a group context and it was considered that individual interviews might yield more forthright opinions.

The rationale behind conducting targeted expert interviews was the guarantee of a high level of knowledge and critical feedback in the interviewee's field of expertise. This would benefit this research in two ways – firstly by assessing and validating the application and translation of design principles from related disciplines in the context of screen typography; and secondly, by expediting additional literature searches to find relevant references.

Aim and Objectives

The overall aim of the interviews was to obtain a first phase evaluation of the *Practice Matrix*, specifically with regard to the following objectives, in order to:

1. Validate whether the *Practice Matrix* represented an understandable conceptual model of a practical methodology for screen typography, and to see if they could envisage it being used in practice;

2. Critically assess and validate the list of screen properties and their definition and application in relation to screen typography;

3. Obtain additional recommendations and references from the interviewee's field of expertise;

4. Identify omissions and erroneous information, and to clarify necessary modifications.

Selection Criteria and Interview Profiles

In order to meet these objectives, the following selection criteria were derived for the selection of relevant and appropriate interviewees. Candidates were sought on the basis of:

- Currently working as a practitioner in one of these relevant fields: graphic design and typography, web design and development, interaction/UX design and development, animation, film, motion graphics, HCI, art and design education;

- Having ten or more years of experience in the field or have shown significant contribution to the field through their work output and expertise;

- Having experience working as both a practitioner and an educator;

- Having traditional and digital skills, training and education.

The following table (table 7.1) presents the credentials for the five interviewees who agreed to take part in the interviews to evaluate the *Practice Matrix*:

Current title	Discipline / Professional Expertise	Educational Experience	Education & Training	Key skills/ noteworthy work	Discipline Identifier for Citation
Creative Director of Fís (Film in Schools) IADT.	Film-making, Sound Design for film	Digital media trainer, Certified Apple Educator, Visiting Lecturer	BA in Film & Television, MA in Education & Digital Learning	Writing and teaching film and digital media education & training programmes Author of EuroCreator	**Film**
Live Action Director & Motion Graphics Designer at SuperSixtyEight	Motion graphics design and post-production, live action director (commercials)	Visiting Lecturer to design programmes	BA in Visual Communication	Multiple design awards, U2's Zooropa Tour & Album, TV idents. for TV3, TG4 and MTV, ads for Coca-Cola, Spar etc,	**MG**
Animator, script writer and Lecturer in Animation, IADT	Classical animation skills, script writing (animation and live action)	Course Director and Lecturer in Animation	Diploma Classical Animation BA in Animation MA in Screenwriting	Award winning film 'An Evil Cradling'	**Animation**
Associate Professor and Director of Human Interface Technology (HIT Lab) Australia	HCI, Information Visualisation, Ubiquitous and Pervasive Computing, Interface Technologies	Lecturer in Computer Science (under graduate and post graduate), PhD supervisor	BA in Computer Science, PhD in Computer Science	100 internationally peer-reviewed publications, 3 patents	**HCI**
Principal and Creative Director at Spin (graphic design agency), London and Founder of Unit Editions (design publisher)	Graphic Design and Typography for Print, Web and Motion Graphics	Visiting lecturer internationally, external examiner internationally	BA in Visual Communication	Internationally renowned award winning designer, TV idents. and title sequences for CH4, More 4, MTV,	**GD/Typo**

Table 7.1 Interviewee Profiles

In addition to the above five interviews, an opportunity arose, through the attendance at a conference, to conduct a spontaneous interview with an academic author specialising in animation aesthetics. This interview was shorter (30 minutes) than the others and covered partial aspects from the script used previously. The critical and insightful feedback from this interview is also included below.

Spontaneous Interview (partial)					
Professor of Animation Aesthetics and Director of the Animation Research Centre	Animation and Experimental Film Theory and Aesthetics	Tenured Professor, Visiting lecturer internationally, Author, Founder and Editor of Animation: An Interdisciplinary Journal	PhD in Animation Theory & Aesthetics	International conferences and publications, Curatorial work for international film and animation festivals	**Animation & Experimental Film**

Table 7.2 Interviewee profile

Structure and Design of Interviews

Semi-structured interviews were conducted with five highly qualified and experienced professionals working in key disciplines identified closely with this research as outlined in table 7.2 above. Each interview was face-to-face and lasted approximately 1-1.5hours. A transcript of each interview is included in the Appendix IV.

The interviews were structured in two parts using an open-ended style of questioning that were customised each time according to the different disciplines (Robson, 2002). However, the questions in all interviews were designed to address the following common issues:

Part A – Individual Practitioner Perspective

- To establish the background education and training, professional expertise and skills of the interviewee;

- To ascertain their view of core practical principles from within their discipline;

- To establish their understanding of screen typography.

Part B – Practitioner Feedback on *Practice Matrix*

- To obtain their critical response to the *Practice Matrix* as a model for a practice methodology – did they agree with the overall concept including: elements, properties and principles (functional and interpretative), criteria for good design and proposal for how to apply it in practice.

- To specifically record their critical evaluation of how concepts, principles and methods from their discipline were applied in the context of screen typography.

During the interviews, the boundaries between Part A and B often became blurred as interviewees referred to their own experience and practice in the course of validating and assessing the application of principles from their discipline to screen typography. It is also worth noting that depending on the discipline and expertise of the interviewees, the emphasis and engagement on the above points varied. Some interviewees engaged fully with all points while others put more emphasis on one aspect over another.

For the purposes of citation, the discipline identifiers listed in the table 7.2 will be used when referring to specific feedback from an individual interviewee.

7.2 Interview Feedback and Evaluation

The critical analysis and comparison of the transcripts was based on using a combined approach of thematic coding and grounded theory (Robson, 2002), where it was possible to determine a number of common critical strands that emerged in the both parts of the interviews. The analysis findings are broken down into two parts (A and B), under the following respective sections:

Part A – Individual Practitioner Perspective

1. Basic Principles as a foundation of good practice
2. Digital media requires trial and error, a willingness to learn independently, and to collaborate with others
3. Interdisciplinarity is a key success factor for working in screen media
4. Comments on understanding screen typography

Part B – Practitioner feedback on Practice Matrix

1. Overall response to Practice Matrix
2. Discipline specific responses to properties and principles in the Practice Matrix

Under each section salient quotes have been extracted which exemplify the main themes that emerged out of the interviews. The main issues and their relevance to this research are detailed in the discussion that follows.

Part A – Individual Practitioner Perspective

1. Basic Principles are the foundation of good practice – learn the rules first, then break them

All interviewees had received their initial education and training in traditional principles, using primarily analogue methods. Most had latterly been introduced to digital media when they started working professionally. This is largely due to the age profile of the interviewees (29-40+) and the lack of availability of digital technologies in their discipline at the time of their education. There was consensus that traditional principles formed an invaluable foundation of practical skills essential to good practice and understanding of their discipline. Most believed that core principles should be mastered before engaging with digital media methods and tools because the technologies presented too many possibilities and a lack of constraints which could be overwhelming for someone starting to learn a practical discipline.

GD/Typo*…its very hard to keep your sensibility when you go onto the screen…because it's like looking at an endless sea of possibilities…its overwhelming, like a vast plane…you need a fundamental base…*

All interviewees confirmed the need to learn basic rules, principles and techniques before 'breaking rules' or starting experimentation. Four citations from the interview transcripts demonstrate this point:

Anim...*The rules are the tent poles of animation technique...the rules are the currency underneath – they can be equated to laws, or craft techniques – if you do this, this will happen – once you get an understanding of the rules and know them well...masterfully, you can gamble, break them...*

GD/Typo...*(on Typography) First they need to understand what they are breaking...the sooner they can, the better for them when they work on screen...if they love the arrangement of it, the layout of it, the design of it, the forms of the letters...from the bottom to the top, if they love it, and can get it, they are off and running...*

MG...*Typography and composition and a good design sensibility are among the most important skills, you have to have an eye for this the whole way through...at the end of the day – all these elements are all shapes and will have a relationship with other shapes the whole way through – you have to be able to compose them in relation to each other, be cognizant of this...must be able to close your eyes and compose the finished key frame in your mind and visualise it...*

HCI ...*so it is really important to understand the machine in its rawest form...you have all these individual chips doing various different things...interconnects between them which send messages back and forth, there are registers which store information, there is memory which holds data, there are processing units, there is input/output chips, there are chips that drive the graphics display....and once you understand all that, then you look at a program and you start to understand what each section would do... you start to understand why it all works they way it does...Once you can break any problem down into small manageable parts, then you can tackle it, that basically defines the vast majority of what is in computing processes...*

Learning basic principles and understanding how to apply them was a central tenet of Emil Ruder's practical method and underpins the model presented in the *Practice Matrix* in this research. These interviews confirm that this is also a sound basis for practice in other disciplines and that the role of experimentation should flow naturally after a solid grounding in core skills has been achieved.

2. Digital Media requires trial and error, a willingness to learn independently, and to collaborate with others

The technical barrier for making screen based work (in web, motion graphics, animation, film, software) was acknowledged as a continual source of frustration to traditionally trained practitioners in these interviews. The need to collaborate with others who have technical expertise was also recognised.

Film..._sometimes, what we teach is not even about the media principles, it is about getting over the fear of using the technology in general..._

GD/Typo_...design is more collaborative than it used to be...now you can't be expected to have all of the technical capabilities at your fingertips...because as soon as you choose one, you are limited by that one because another one comes along and wipes it out.._

Anim_...unless you are using computers everyday, you forget...there is still a dichotomy between animators who are technically brilliant at production but whose animation skills are poor..._

MG_...Sometimes, I will avoid a creative solution if I think I can't pull it off myself technically, but mostly, I will either figure out how to do it myself, buy someone in to do it, or else think of another way of doing it._

All interviews confirmed that in order to engage with digital media and to overcome the technical barriers involved, there had to be a willingness to learn independently which was usually motivated by a strong desire to make something specific using the technology.

GD/Typo_...Even though, I didn't have the technical skills, I was damned if I was going to get in there some way. I can't print things but I can talk to a printer, so I was determined to get into this – we actually got in through CD-ROMs – that's how we got into motion graphics and websites...we all had to learn this stuff..._

In many cases discussed by the interviewees, it was both the need and desire to make a particular creative outcome – which required specific digital media tools/technology to achieve it – that was the driving force behind their engagement with digital media. This often resulted in a precipitous approach, learning on the job and making mistakes – but ultimately created a rapid immersion in digital media tools and techniques relevant to their discipline.

MG_...I was reading the Media 100 manual on the plane on the way to the location...Out of ten pieces that I made that year, five were technically wrong...in actual fact the work should have been rendered as square pixels...it didn't really phase me, the excitement of what you would get at the end was much more important..._

GD/Typo_...they need to get lost first, we got lost...then you truly start to understand the possibilities..._

Additionally, because their entry point was from a traditional perspective, their initial explorations were often based on trying to achieve results akin to using analogue methods rather than just using the features inherent in the software. This ensured that the emphasis when using digital tools was a design-led practice rather than technique-based approach.

GD/Typo_...we bring in our sketches and our rough bits and pieces...we have a very clear vision so we know we are not being run by the machines...I remember when we were working on Dispatches for Channel 4 – which has a story unraveling like a t-shirt...we looked at knitting so we could figure out how unraveling actually happens as opposed to how we thought it would work on the machine..._

It has been a consistent aim of this research to focus on screen typography from a design perspective that remains independent from specific technologies. At the same time, the research is cognizant of interrogating the underlying properties of the screen to ensure that design practice directly addresses these properties irrespective of the digital platform or tools being used. In this way the *Practice Matrix* echoes the importance of design principles driving the use of digital media and not the other way around. It also guarantees that the research contribution is more sustainable in the rapidly changing environment of screen technologies.

3. Interdisciplinarity is a key success factor for working in screen media – requires the ability to visualise, conceptualise time, movement, space, use technology, maintain aesthetics concerns and to ultimately captivate an audience...

A number of interviewees made recurrent reference to the interdisciplinary nature of the screen and the broad range of skills and abilities required to make work in this territory. This discussion gave rise to outlining the core principles required for practice. As this discussion unfolded, it was apparent that the *Practice Matrix* encompassed the main concerns that were expressed in the interviews, which centred around; motion, sound, interactivity, space and time.

GD/Typo...*the exploration of making a piece of typography move, a whole world becomes available to you – of transition, and timing, and story telling...but it can be like a runaway train, so you have to be in control of it...*

Anim...*if you apply all these things (principles) in the method of learning – then the chances are you will be able to create a realistic performance through 2D drawings, Flash or 3D that an audience will buy into, will make them laugh, or cry – this is the end goal...*

HCI...*its a very creative process, model making, writing, prototyping, drawing, using physical material to make prototypes quickly, presentation skills...its interdisciplinary, computer science and graphic design...*

MG...*in motion graphics, you have to keep all the plates spinning...have the ability to understand a 3D world, but also to look at it in a 2D way, ability to work over time, have a good design sense, think about sound and visuals from the word go, ability to think in a lateral sense technically...its a very demanding area, it's a lot to grasp...*
...*need a combination of these to achieve a response from the audience...*

The range of interdisciplinary properties described by the interviewees form an integral part of the core properties of screen typography (motion, sound, 3D, interactivity) that are articulated in the *Practice Matrix*. These screen properties are distinctive and additional to those normally associated with print typography, which are also included in the *Practice Matrix* but modified to suit the screen context. In the second part of the interviews these properties are interrogated in more detail.

PhD Thesis: Chapter 7: Application and Evaluation of Practice Methodology © Hilary Kenna, 2012.

4. Comments on and understanding of Screen typography

Depending on their discipline and expertise, the opinions and understanding of screen typography varied among the interviewees. Some expressed a more functional and technical perspective about the role and rendering of text on screen, while others were concerned with the difficulties of aesthetic typographic expression in a screen environment and how it affects audience interaction.

These opinions provided useful points of critical exploration of the *Practice Matrix* in the second part of the interviews.

Film –*It is less about the art of typography and more about the message it displays and its importance. Our rule of thumb for a story (text based) is we have 90 seconds to tell our story – we have 10 points that we want to make in a story – and in reality we can only have 8-9 words in each point. So basically all of our stories are 80 words long. The target audience is teachers, adults. For kids, the typography is used solely for credits – its incredibly important for their achievement.*

HCI...*I prefer iconographic interfaces...should minimize text in an interface...it takes a lot to process text...I don't like text as art...its too slow...it takes too long to process text...images speak to us much faster...Text will be supplemental to the image world, query-based...good for deep information...Legibility is the most important factor.*

These two comment addresses the issue of 'reading' in a viewing experience – if the audience is watching a linear piece of motion graphics or film and have no control over its duration – there has to be an amount of time assigned to enable the audience to read the words and absorb their meaning. This poses critical questions for designing the movement of text on and off screen – that are not just about the aesthetic and life-like qualities of the animation. It also draws attention to the tension between text as image, where interpretative expression is often prioritised over legibility, and text as information where legibility is foremost priority.

On the other hand, the kinetic qualities of a text is a fundamental design concern, which if executed well is not only aesthetically beautiful to look at but fundamental to the interpretation of the text's meaning. This combination of form and meaning is a key principle in the *Practice Matrix* – derived from Ruder's unity of function and form. Described with different emphasis below, the interviews confirmed how the visible form of typography on screen represents not only aesthetic, but functional and interpretative concerns.

GD/Typo...*we acted out how we wanted the type to move, they had so little to work with...type moves off, the pace it moves, slows down and moves back, that's what makes it look elegant and gorgeous...the nuance of movement...*

Anim/Exp...*There are key questions around meaning, what does it mean for type to move? What does it mean for reading if words come rushing at me?*

Anim...*there must be an inciting incident...the point where the audience goes Ahhhh, and gets involved in the story journey....This can be equally applied in non-narrative work, like typography – an inciting incident could be a clash of two colours or letters!*

The need for higher quality legibility and typographic display was another theme that emerged in the interviews. There was general consensus that the resolution of screen technologies was poor in comparison with the refined quality of print. The continuing requirement to compensate for this disparity was mentioned by a number of interviewees:

HCI... *the brightness and the resolution of the screen...all these devices are currently too crude to render decent fonts...because they look pixilated...it really bugs me that I can't standardize the fonts across all the multiple displays (iPhone, laptop, public display)...*

MG...*there are rules for typography on screen, it should be big, chunky, simple, colours need to be safe colours, letter spacing should be more generous...*

Although, the interview participants had not seen the Practice Review during the first half of their interview, the summation of feedback from all five interviews was generally in accordance with the research. The open discussion around practice in their own discipline prompted interesting insights (some of which are discussed above) that helped to smooth the transition into the second half of the interview and set the context for further exploration.

Part B – Practitioner Feedback on *Practice Matrix*

The second half of each interview focused directly on the critical response to the *Practice Matrix* and the evaluation of specific properties and principles within it.

1. Overall response to Practice Matrix as model of a practice methodology...

It was necessary to present a full explanation of the background context and relevance of Emil Ruder's method in the development of the *Practice Matrix* before engaging the critical evaluation of the interviewees. They needed to understand it before they could assess it.

There was no difficulty in understanding the overall model of practice represented in the *Practice Matrix*. It seemed to strike a familiar chord with a number of the interviewees who could find analogies in their own discipline to this type of approach.

GD/Typo...*This is totally singing with me. There's a real gap for this...its really scary that this hasn't been dealt with before...*

HCI...*I could take this and apply it to other things...I could take the Irish Times on the web and map these onto it...*

Anim...*Your list are like the tent poles of animation technique – which by the way have been discovered through process and reflection throughout the last 100 years since animation was born – to get to a*

point of performance…your design principles when used as rule-breakers are like light-bulbs – they can be anything, exaggerated, unexpected that distinguishes the work…

Most interviewees also considered the model to be comprehensive because it included an underlying philosophy of practice, as well as criteria for what is good and beautiful design.
There was however commentary that beauty is subjective and that there was a danger of being prescriptive.

During the explanation of the matrix formula, a number of interviewees expressed an interest in trying it out and said they could see how it was flexible but had a definite structure at the same time. All interviewees wanted to see how it was applied to screen typography and to have the individual components of the matrix explained in more detail. This led to the main objective of the interviews – getting discipline specific feedback on how the properties and principles, from the interviewees' field of expertise, were interpreted and applied to the practice of screen typography.

2. Discipline-specific responses to properties & principles in the Practice Matrix

Critical feedback from each of the interview participants to the properties and principles in the *Practice Matrix* is presented below is tabular form. Due to the variance in discipline and expertise amongst the interviewees, there is an apparently different emphasis in the critical feedback provided by each interview.

The main focus in the critical evaluation of the matrix was on the screen properties of typography, not the print properties, although the Graphic Design/Typography (**GD/Typo**) and the Motion Graphics (**MG**) interviews confirmed the interpretation of the print properties as being appropriate for screen usage. Additional comments about screen typography by the other interviewees are detailed in Part A feedback.

Each of the following tables (tables 7.3 - 7.8) is dedicated to one of the screen typographic properties listed in the *Practice Matrix* – which details; how the property is applied as best practice using design principles as rules; what design principles are suitable for further experimentation with the property; and what practical methods and processes are used in relation to that property. The interviewee comments are listed beneath under each relevant heading.

Property: **2D**			
Source	**Design Principles as Rules (Formal and Functional)**	**Design Principles as Rule-breakers (Expressive/Experimental)**	**Methods/Processes**
Practice Matrix	• Vertical and horizontal (baseline) pixel grids (ref 960) derived from content + type measure • Surface divisions: halves, thirds, focal points • Safe areas • Shot types and framing • Camera angles	Arrangement Proportions Rhythm Formal Unity	Thumbnail Paper mockup Photoshop mockup HTML/CSS wireframe Storyboard, shot-list
Film	Framing for 3 shots essential –: wide-shot, mid-shot, close-up. Rule of thirds is key, do not centralise characters.	Formal composition, proportions and arrangement - yes Consider contrast in compositions. Rhythm and Formal Unity – more associated with **editing,** easier to see it there, but maybe also in storyboard.	Storyboard is used here for 2D visualization – but also shows 3D camera directions and movements.
MG	2D image is key in motion graphics – could be the shot – that everything is based on. 2.5D is where 2D and 3D collide in motion graphics – its difficult to understand.	Arrangement, Formal Unity.	Mood board, visual research, still mockup, Storyboard, Grids.
GD/Typo	The screen has the potential for structure in the same way as a piece of paper – not necessarily in 2D way. The screen has potential for structure that can be larger than the surface area – larger than the surface area you that you actually see. Start with the 2D image on the wall, look at it as a flat object, as an idea first, look at it objectively, in a flat way, then start imagining where it can go, what possibilities in may have.	Arrangement, Contrast, Variations	2D visual studies, Storyboards

Table 7.3 Interviewee responses to 2D property.

Property: **3D**			
Source	**Design Principles as Rules (Formal & Functional)**	**Design Principles as Rule-breakers (Expressive/Experimental)**	**Methods/Processes**
Practice Matrix	• Stage Line & 180º rule spatial grammar for continuity • Staging and edgelessness • Camera movements • Layers (opacity, foreground, middle ground, background) • Space depth cues: perspective, distance, focus etc (for deep /flat / limited / ambiguous space) • Lighting	Arrangement Proportions Contrast Shades of Grey Rhythm Formal Unity	Storyboard Animatic Motion test Wireframe
Film	Foreground, mid-ground, background. Continuity and reversals, eyelines. Crossing the line is important to understand in this context, also dealt within **editing**. Space-depth cues not really. Lighting yes very important.	Perspective and focus are key. Arrangement and rhythm of shots is editing. Formal unity of shots together – fluid continuity and aesthetic.	Storyboard for camera movement and directions, and guide for editing. Also first rough cuts from rushes.
Anim	Stage line or 180º rule critical to in organizing and designing 3D space. Also huge consideration in motion and in 2D, but in 3D motion it multiplies. Very difficult to conceptualise and visualise – need to experience it. Space-depth cues not convinced.	Arrangement and Proportions.	Storyboard Acting out movement in 3D space with 2D grid on the floor.
MG	2D/3D or 2.5D has become a trend – creating clever camera moves from one 2D plane to another to the illusion of 3D space. Composition and layers important.	Arrangement Shades of Grey – good for layers – tone and depth	
GD/Typo	Z-axis is very exciting! Need to understand where you need solidity and flexibility, a combination of solid structure and flexibility	Arrangement Shades of Grey – deals with tonality or colour, it makes the figure/ground relationship. Could be used here for creating a sense of depth between layers.	Storyboard

Table 7.4 Interviewee responses to 3D property.

Property: **Motion**			
Source	**Design Principles as Rules (Formal & Functional)**	**Design Principles as Rule-breakers (Expressive/Experimental)**	**Methods/Processes**
Practice Matrix	**Movement** • Line of action • Squash & stretch (weight & volume) • Anticipation / staging • Follow-through & Overlapping Action • Slow in / slow out • Arcs • Secondary Action • **Timing** • Exaggeration • Appeal	Contrast Rhythm Texture Kinetics Spontaneity Formal Unity	Storyboard Animatic Motion test
Film	This applies more to animation, but camera movements should feel fluid and natural.		Storyboard and editing
Anim	All of these principles apply to the **movement** of a character or object. **Timing** is key here. Timing can be learnt but texture can't. **Motion** is something that moves from A to B. Timing is the texture that is applied to it. Editing is about motion, which is the experience we feel as the viewer. **Editing** is a better bed-fellow of **motion** than timing. **Timing** relates to movement – the design of timing is texture, which is probably a principle. The list are natural laws of motion that can be applied to representative or abstract elements – may be some duplication here, may be some not so relevant.	**Texture**. Contrast might be akin to it? It's the fine grain, detail. Texture is the feeling you get when you put all of the building blocks together. (weight, squash n' stretch etc) It can be applied to anything – performance, timing, weight, volumes. It's also akin to **beat**! Example: perfect lip-synching can look poor if it has no beat. Example: Picking up a phone. A movement and an action should never be the same, so you don't over on an arc and back on the same arc – you should go under, pick it up and go down. Taught in animation by the **Salute example** – hand up in one way, long way up, down in another, short way down – this is to ensure the movement is not even, lifeless. This is texture applied in a movement mechanism. Then there is how movement is actually timed **- slow in, slow out** – this is texture applied to timing.	Storyboard, animatic, line-tests
MG	Don't know this list but when you explain them I can interpret them. I probably call them something else. Slow in, slow out is essential for smooth keyframes. Can learn this technique – how to technically do it. But good animation comes naturally, some people are born with the sense – a gut sensibility.	**Contrast**, don't want all the movement to look the same – things should move at different speeds.	Animatic, Motion tests
GD/Typo	Can be utterly soulless putting flat graphics on screen – you've got to	Contrast, Rhythm, Texture, Variations Need to do lots of versions	Storyboards with lots of annotation,

			paper mock-ups, Motion tests
	make it have nuance so its lives – that detail is very difficult to get. Try to find a real-life analogy for the movement. After coming up with the idea, its about trying to make it move in a beautifully, human and elegant way. I am amazed by the list – didn't know this. We call it ramping, ramping down in and out again, ramp up quick etc. Human, naturalistic, beautiful, achieved with minimal means...its very hard to do.		

Table 7.5 Interviewee responses to Motion property.

Property: **Motion – Timing** (sub-property)			
Source	**Design Principles as Rules (Formal & Functional)**	**Design Principles as Rule-breakers (Expressive/Experimental)**	**Methods/Processes**
Practice Matrix	**Timing** • Frame rate / speed • Picture / sound synch • Duration • Accents • Beat • Counterpoint • **Editing**	Texture Rhythm Variations	**Editing** – rough cut, first edit, second edit, third edit, final cut.
Film	**Editing** should be a separate heading. It is really important. Most of these apply to editing – there is some overlap also with sound. In film, editing is determined by narrative not sound. The style of editing or beat/rhythm comes from the narrative – length of scenes, moments etc. Editing on action is also key here.	Arrangement and rhythm are key here. Arrangement is key function of editing – take out footage you don't want, arrange footage you want/need to tell the story concept. – how you get from one place to another in the story. Rhythm has to do with style of editing – fast, even, slow etc. Variations could be different edits with different emphasis, or endings!	Editing process, comparing edits to storyboard. Critiquing edits.
Anim	In film, **Timing** is achieved through **editing**, could be also refer to **beat** – as it is in terms of scriptwriting. In this context, timing is specifically related to time e.g. scene 1 is 4 seconds, it's the duration. It could be applied to a still image – duration. **Beat** however can be an over used aesthetic/technique in script writing – should be used sparingly, cleverly. Actors hate to see the word beat in a script because they think it's their	Texture applied to the timing of a movement is technique – can be technically brilliant, the fine detail all the way through, but the overall narrative piece pulling it together may not be good. Texture applied to editing is broad brush – e.g. timing and rhythm of the whole piece. Texture can't be taught as such. Have to have awareness, recognize it, practice it, learn it, eventually be able to use it	

	job to interpret where the beats go. A beat (in scriptwriting) is a momentary pause on thought of delivery, a reflective moment between two parts that makes the two parts better than the original delivery without it.	as a technique.	
MG	From an **editing** perspective – it's an ability to watch a piece of footage with the music on and know instinctively where to put the edit. It's the ability to watch things, its incredibly abstract – to see each frame, to see a mistake, to know where to put an edit in the timeline. There are guiding principles – from a structural perspective – e.g. 30 second ad has a structure – once you break it down its much easier for someone to understand (who hasn't got an innate sense of timing) Can teach timing for motion – e.g. animate by synching to the beat. Could teach alternative by animating off the beat, at different speeds, combining both etc.	Spontaneity, Variations	Editing process
GD/Typo	Timing is instinctive – automatically match images to sounds. Graphic designers have different notion of timing to **editors** – perhaps because of book design – look at things in a different way – not straightforward, listen to a different rhythm, discordance. Timing can also apply to **interactivity** its not the same as timing applied to animation.	Contrast, Variations	Editing process, motion tests

Table 7.6 Interviewee responses to Motion (timing) sub-property.

Property: **Sound**			
Source	**Design Principles as Rules (Formal & Functional)**	**Design Principles as Rule-breakers (Expressive/Experimental)**	**Methods/Processes**
Practice Matrix	• Synchronous (on the beat/exactly on action) • Asynchronous • Counterpoint • Accents • (Diegetic/non-diegetic) • Overlapping	Contrast Rhythm	Breakdown chart/x-sheet Storyboard Animatic Motion test

Film	Sound is central to editing process. Analyse sequence with and without sound, with different types of music/sounds, with different speeds/rhythms. Choose style/speed of music to suit narrative intent. Can edit to synchronise with sfx.	Rhythm/beat in the cutting – can begin slow and get faster, build up, then slow down again...doesn't have to be based on music. Cutting to the beat is based on rhythm/beat in the music – e.g. image changes on beat of music.	Editing process – different edits with sound track variations.
Anim	Sound is dealt with precisely in animation – voice is usually recorded first – and broken down by 24 frames per second. Animation on 1, 2 or 3 beats e.g. keyframe every 24, 12, or 8 frames.	Texture, rhythm. Synching exactly, animation should anticipate the sound by 1 frame to be exactly synched. Can use counterpoint – contrast?	Dope sheet/x-sheet
MG	Role of sound is huge – can't overstate its importance. Must think about sound and visuals from the word go. Get samples to go with mood board. Listen to layers and layers of things happening in the music, beats and off-beats.	Rhythm, contrast.	Samples for mood-board and motion tests

Table 7.7 Interviewee responses to sound property.

Property: **Interactivity**			
Source	**Design Principles as Rules (Formal & Functional)**	**Design Principles as Rule-breakers (Expressive/Experimental)**	**Methods/Processes**
Practice Matrix	Content Structure • Information/Narrative structures: linear, hierarchical, matrix, web, parallel etc Access • Navigation (global, local, primary, secondary, tertiary) • Consistency and standards • Usability/Legibility Interaction/Experience? • Mapping to real world tasks • Cater for different levels • User control & freedom • Low mnemonic load • Exploratory/Play Feedback • Visual and aural cues • Informative feedback • Dialogs for closure • Error prevention • Reversal of actions • Reward • Help & documentation	Arrangement Proportions Contrast Shades of Grey Rhythm Spontaneity Integral Design Unity of form & function	Paper prototype Flowchart (structure + process flow) Dramatic Pitches Diagram Storyboard Wireframe Prototype – **Agile method** User centric Task driven output Short timescale release Iterative

Film	Narrative is key here. Structure and intent of narrative. Editing decisions affect this.	Variations and Spontaneity apply here. Maybe contrast.	Script, storyboard and editing process.
Anim	Narrative structure is key to interactivity – the journey you take the audience on – playing with the viewer. Use inciting incidents and dramatic pitches to do this – must think like a storyteller and carefully structure them into the narrative timeline – ensure they are also in storyboard. Inciting incidents tell us what's happening and create the reason in the story for the audience to follow/engage with it.	Texture also applies to narrative structure as beat.	Diagram of Narrative Dramatic Pitches Storyboard
MG	Most important thing is the emotional reaction of the audience. Script is all important – storyteller in the driving seat.		Script, Storyboard
GD/Typo	**Timing** is often the choice of when the user wants to use the next bit of a website. The potential for that next event has to be there, but designer can't dictate when it's going to happen. Its about the temporal decisions that a user makes within a single page on a website e.g. like an image gallery. Could also be analogous to magazine design – browse headlines, scan pictures and pull quotes, read full article etc. Reward for user clicking should be high – get what they want and more – if you like this, you might also like this. Create a dialogue with the audience.	Unity of form and function Variations	Mock-ups, Storyboard, Prototypes
HCI	Agree with this list – can see the references and sources used to create the list. Cognitive flow is another important concept – **UI/UX** (user interface/user experience) shouldn't disrupt this. UI/UX should be simple, straightforward, low barrier to entry, but can get deep. 4-5 functions on the surface, dig down it gets more powerful. Legibility is also important. UI/UX should be emotional, physical, psychological, and now social as well as functional. Has to embellish your world, make a more aesthetic experience.	Unity of form and functions Variations	Interaction Design process – engages users at early stages – user profiling, mock-ups, prototypes, testing Or Genius/Innovation Design process (like Apple) – designing things people don't know they want, yet. Or User Centred Design (UCD) process – treat users as co-creators, it may not necessarily be a technology solution

Table 7.8 Interviewee responses to interactivity property.

7.3 Summary of Interview Findings & Revision of *Practice Matrix*

The following summary of findings from the expert interviews will inform the next revision of the *Practice Matrix*. In addition to the verbal feedback provided during the interview articulated in section 1.7 above, each participant also confirmed the list of literature sources relevant to their discipline that were used in the research, and recommended some additional references. These new sources will also contribute and affirm the modifications to the matrix.

- **Print properties** adapted and applied to screen will remain generally the same with consolidation of some properties under a broader heading e.g. word space and line space may become 'spacing'.

- **2D and 3D** – On screen there is a complex relationship between 2D and 3D and how to conceptualise, visualise and realise typography in relation to 2D/3D screen space. Hierarchy, structure, and spatial composition are concerned with both the individual frame and the sequence of frames – e.g. what is in the frame and how it moves to the next frame. The 2.5D world, which is prevalent in screen media, facilitates the exploration and interaction with 2D elements in a 3D space but it requires intricately worked out motion design and composition to ensure audience comprehension. Design principles and methods apply in both 2D and 3D properties cross over so it may be more useful to describe both 2D and 3D together as 'space' or 'space and structure'.

- **Motion** – timing and editing appear to be significant subsets of motion and may require a separate property such as Time/Timing/Temporality.

- **Time/Timing/Temporality** – has several meanings in a screen context – it can refer to the temporal structure of editing (duration of edits), the overall texture/rhythm/beat/style of a dynamic composition or narrative, the timing of a specific movement mechanism in animation, and the temporal experience in an interactive context.

- **Sound** – is an external asset that is added to typography – e.g. it is not part of the typography - rather the typography is designed to behave in a certain way in relation to it - its role in the function, aesthetic expression and interpretation of screen typography is significant. Technically, it necessitates the activation of other properties, such as motion, timing, interactivity, etc.

- **Interactivity** – There is a constant tension between usability versus engagement factors, which is analogous to functional versus expressive concerns. Narrative structure, editing and timing are equally important in an interactive context as they are in a linear one. User centred and collaborative methods that involve testing, feedback and iteration on the design are critical success factors.

- Some of the core design principles may require further interpretation in a screen context such as:

    - **shades of grey** may be redefined as tonality (or 'colour') and depth or perhaps texture;

    - **texture** may be added, but requires clear definition and distinction in relation to contrast, rhythm and shades of grey;

    - **kinetics** needs to be more expansive for screen, it may be redefined to include aspects of timing and editing.

7.4 Revision, Application and Publication

The *Practice Matrix* was subsequently revised based on the critical feedback from the interviews. Time was added as a separate property, and texture was added as an additional design principle.
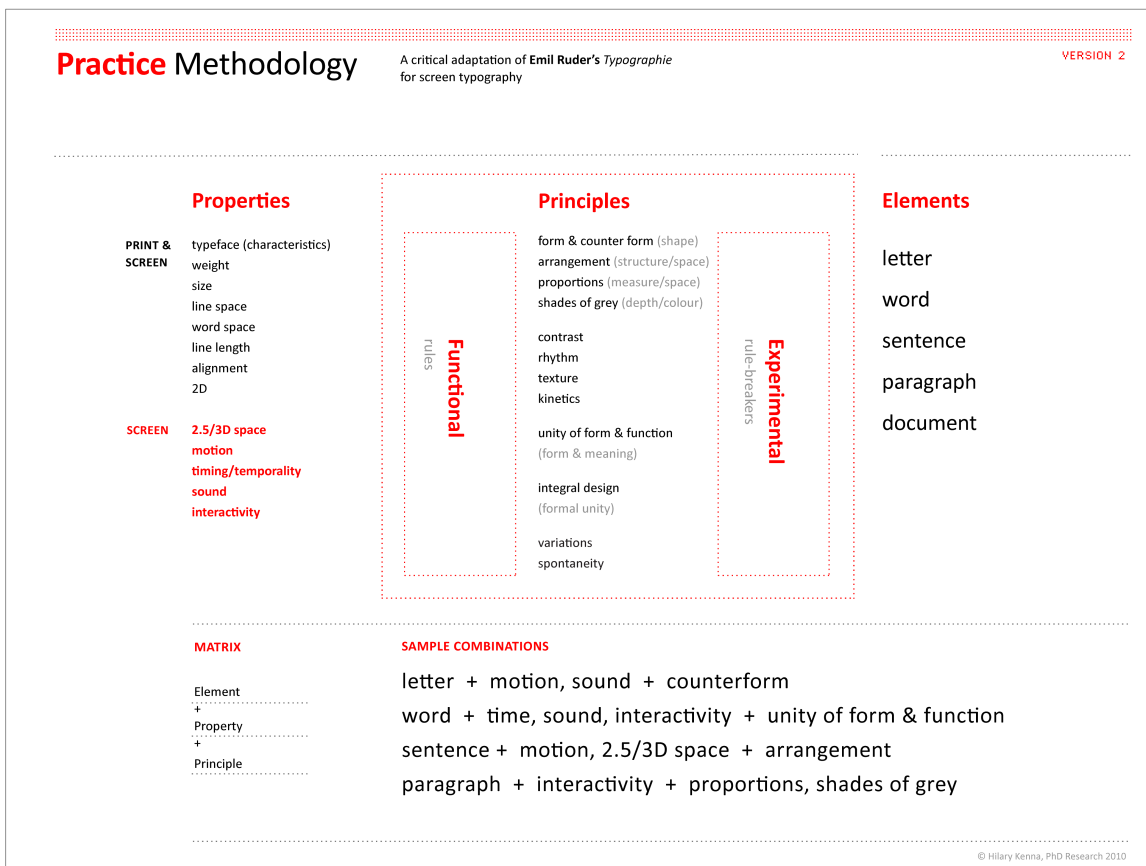
Figure 7.1 Revised version 2 of the *Practice Matrix* for Screen Typography. Revised version 2 of the *Practice Matrix* for Screen Typography. In the second iteration, *2.5D* and *timing/temporality* have been added to the screen typographic properties list. *Texture* has been moved from a qualifying description under *shades of grey* and is listed as a main principle and qualifying descriptions have been modified for *form & counter form*, *arrangement*, *proportions*.

PhD Thesis: Chapter 7: Application and Evaluation of Practice Methodology © Hilary Kenna, 2012.

Application

Subsequently, the new version of the *Practice Matrix* was applied in practice, to create a small sample of experimental studies based on selecting a discreet set of properties and principles from the matrix. The rationale behind this approach was to devise a process of applying the methodology that would typify its use, and show how it could be applied to any set of chosen variables from the matrix.

A formula for experimentation was created from the matrix by combining the selection of a typographic element, with a typographic property, and a design principle as follows:

Element: *Letter +* **Property:** *Motion + Sound +* **Principle:** *Form/Counterform + Contrast*

Ten samples were made for this selection in the form of digital movies, each containing an animated letterform sequence with accompanying audio that was specifically created for the samples.

The practical experiments, and related sketches, along with critical reflection and commentary on the process of making the samples, are published on the *type4screen* practice blog website (see Samples section of www.type4screen.com/practice).

The *type4screen* practice blog was specifically developed for this research as a place to store, critically document, and archive practice samples that were created using the *Practice Matrix* (figure 7.1). This website provides an online method for publishing and critiquing the samples, and includes background information explaining the development matrix in the context of the research (figure 7.4). It also includes the facility to invite feedback and commentary from visitors to the site (figure 7.3).

From a design perspective, the *type4screen* practice blog also demonstrates the application of the principles of practice captured in the *Practice Matrix*, and the wider methodology for screen typography that is the subject of this research. The *type4screen* practice blog was designed using each stage of the development process described in chapter 4 (figure 4.52).

Firstly, careful selection of typefaces suitable for screen use were chosen based on criteria identified in this research (chapter 2). Secondly, a grid was designed based on devising a comfortable text measure (type size, line-length, line-spacing) in conjunction with a flexible web design framework (960 grid) upon which to build it. Thirdly, a content management system (CMS) and blog tool called *WordPress* was used to build the site, and a bespoke design theme was painstakingly developed using the HTML/CSS method.

Figure 7.2 *type4screen* practice blog. The above screen shot shows a selection of practical studies created using a formula from the *Practice Matrix* as the starting point for design exploration. The samples above are animated letter experiments focusing on different combinations of properties and principles from the *Practice Matrix.* Each sample is tagged with the name of the properties and principles it references which generates the alternative tag cloud navigation at the top of the page. Clicking on a thumbnail image will open a page with the animation and a design rationale about the aim of the study (see Figure 7.3).

The design of the site combines two typefaces *Calibri* (designed by Lucas de Groot for Microsoft) and *Unibody* (designed by Underware), both of which were designed specifically for screen use. The colour palette comprises mainly black and shades of grey, with small amounts of red used for highlighting interface elements or for emphasis.

The methodology used to critique the practice samples in the blog (figure 7.3) is based on Donald Schön's methods for the reflective practitioner (Schön, 1987), which encourages practitioners:

- to critically reflect on their actions (implicit tacit knowledge used in practice) and;

- to document the reflections so they are explicitly understandable by others.
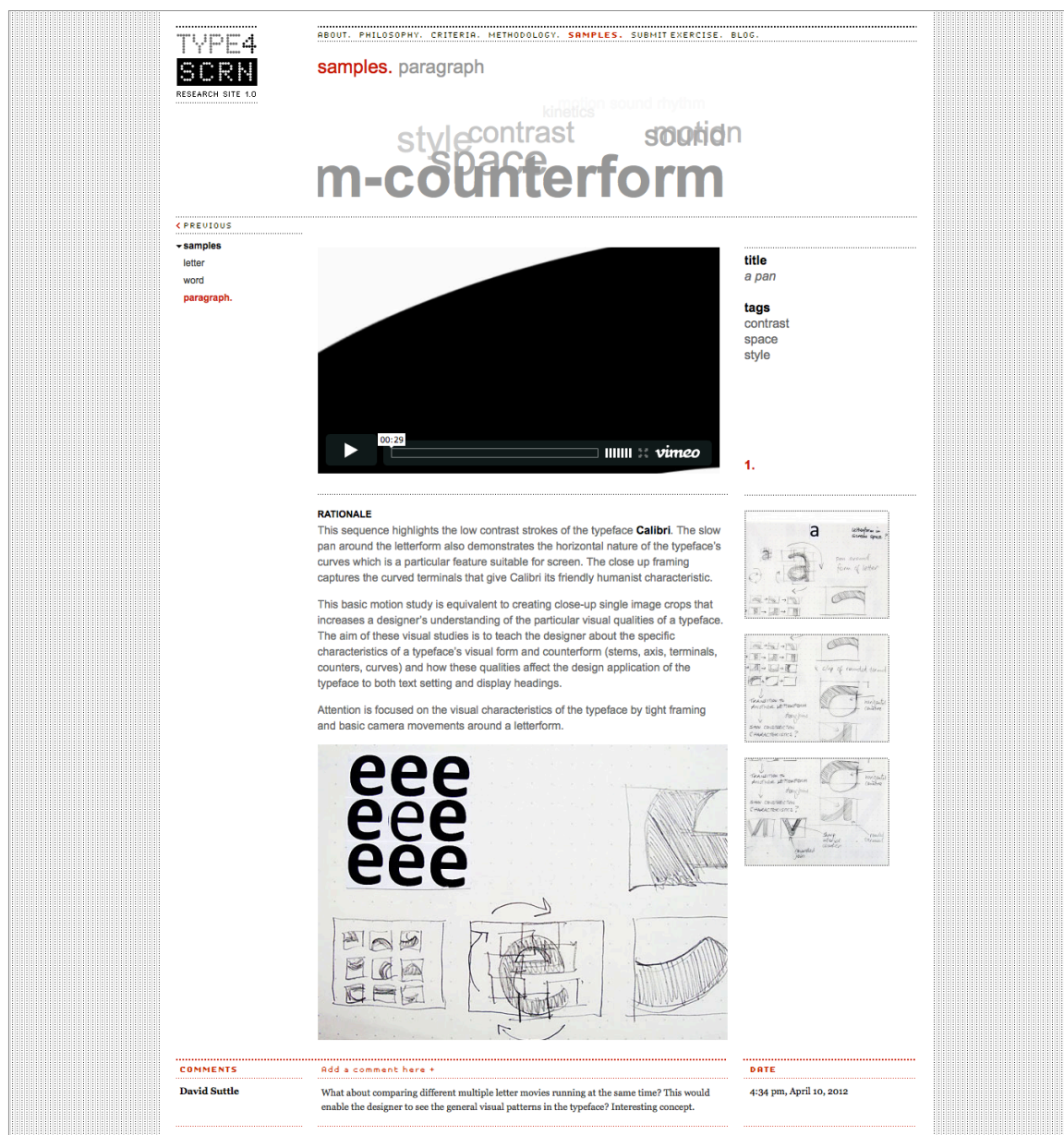
Figure 7.3 *type4screen* practice blog. Web page from the *Samples* section showing the animated movie of a letter study and details about the aim of the piece and the design properties and principles it focuses on. Background sketches are also included. There is a facility for critical comments and feedback from peers or subscribers to the *type4screen* blog.

Each practice sample is presented as an individual blog post, akin to an entry in a reflective practice journal or design diary (Webster, 2001). The *type4screen* practice blog is a methodology for documenting practice, and at the same time is an example of practice.
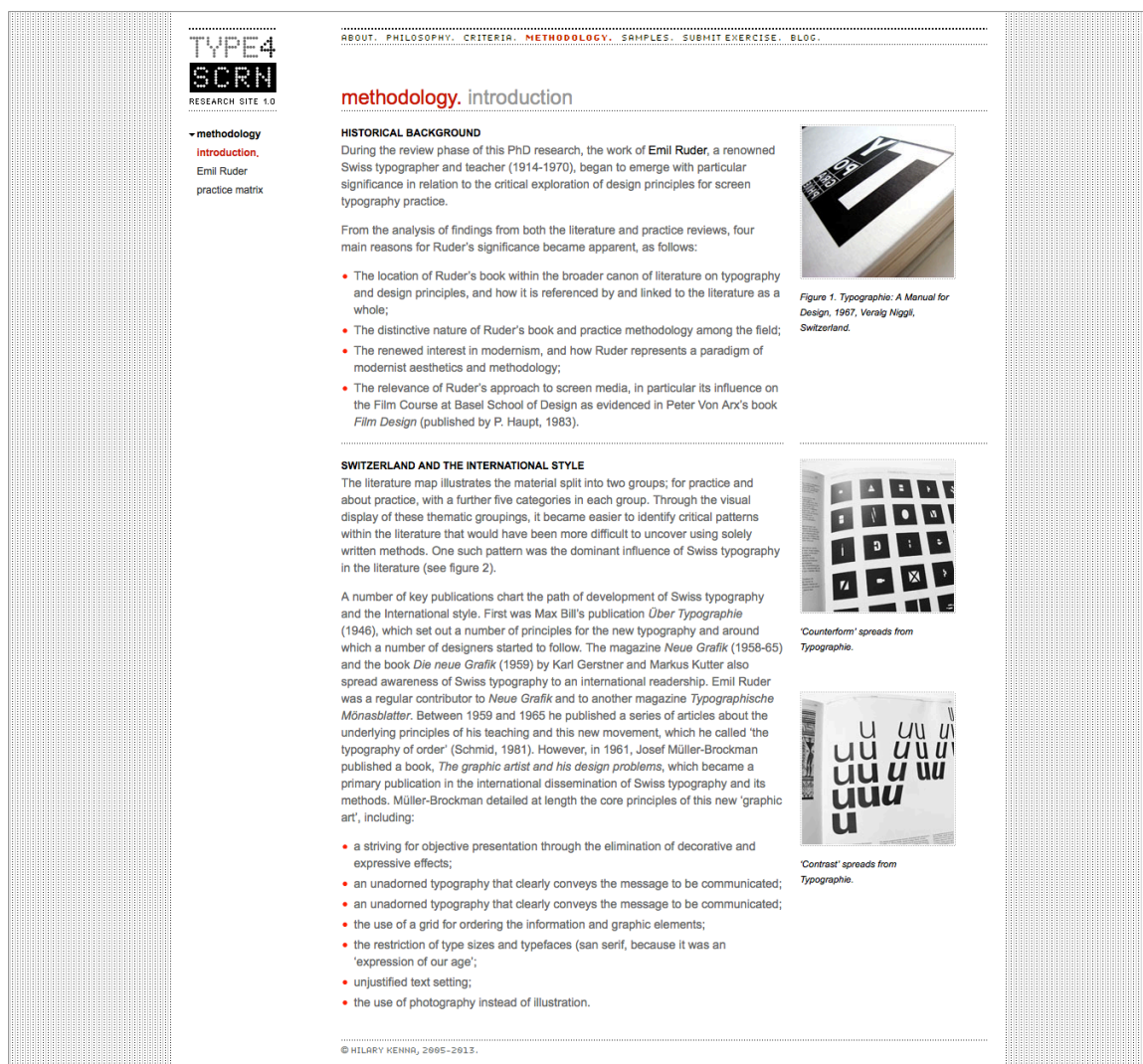
Figure 7.4 *type4screen* practice blog. Web page from the *Methodology* section explaining the background to the research and how it came to focus on the work of Emil Ruder as a key influence.

Presentation

The *Practice Matrix*, practice samples and *type4screen* website were submitted as part of two applications to ATypI's (Association Typographique Internationale) annual conference in 2010, firstly as a full paper – explaining the theory upon which the practice methodology was developed, and secondly, as a practical workshop – explaining and demonstrating the *Practice Matrix*.

The ATypI describes itself as:

> *the premier worldwide organisation dedicated to type and typography. Founded in 1957, ATypI provides the structure for communication, information and action amongst the international type community (ATypI website, 2012).*

The ATypI annual conference presented an ideal opportunity to validate this research with an expert target audience.

PhD Thesis: Chapter 7: Application and Evaluation of Practice Methodology © Hilary Kenna, 2012.

Both submissions successfully passed the peer-reviewed selection process and were presented at the conference, which was held in Dublin, in September 2010. The attendees at both sessions comprised a group of professional type designers, graphic designers, academics, researchers, educators and students working within the international community of typography and graphic design.

While no formal evaluation specific to this research was conducted at these sessions, the general reception to both the presentation and workshop proved positive and generated significant questions afterwards, as well as a number of informal enquiries, which followed when the sessions were over. A couple of comments in particular are worth mentioning, as they are significant in terms of the stature of the contributor or because of their impact on revising the *Practice Matrix*.

I liked your methodological approach to typography for screen, very interesting practical exercises, I can see how students could use it.
(Ellen Lupton, Author, Curator of Contemporary Design at Cooper-Hewitt, National Design Museum, and Director of the Graphic Design MFA program at Maryland Institute College of Art (MICA) in Baltimore)

I'd be happy to publicise your research on my website.
(Thomas Phinney, Senior Product Manager for fonts and typography at Extensis, international speaker and typeface designer).

Other feedback from the question and answer sessions, included:

Have you considered that 'shades of grey' is used to create texture in typography?

Contrast is probably the most important design principle because it affects so many of the other ones.

Do you think design programs have to start teaching new subjects like animation and programming?

The ATypI conference organisers conduct independent speaker evaluations each year, where they ask attendees to rate the presentations on a scale of 1 (poor) to 5 (excellent) using score feedback forms provided. The results of these forms are calculated on a weighted average basis and then posted formally to each speaker shortly after the event. Table 7.9 below details the response to the material presented about this research.

AtypI 2010 Speaker Evaluation	No. of Responses	Average Score
A13: Evolving a Practice Matrix for exploring the materiality and aesthetics of screen typography (paper presentation) *Hilary Kenna, Institute of Art Design and Technology, Dublin, Ireland*		
Speaker effectiveness	10	3.70
Presentation content	9	3.78
B16: Evolving a Practice Methodology for Designing Screen Typography (workshop) *Hilary Kenna, Institute of Art Design and Technology, Ireland*		
Speaker effectiveness	14	4.36
Presentation content	14	4.21

Table 7.9 AtypI speaker evaluation responses.

Publication and feedback from the ATypI 2010 Conference initiated further critical reflection on the composition of the *Practice Matrix*.

Texture was removed as a design principle because it was deemed to activate other principles such as *contrast* and *shades of grey*. Other methods of simplifications were also sought to describe the long list of typographic properties, which seemed too granular in comparison to other aspects of the matrix diagram.
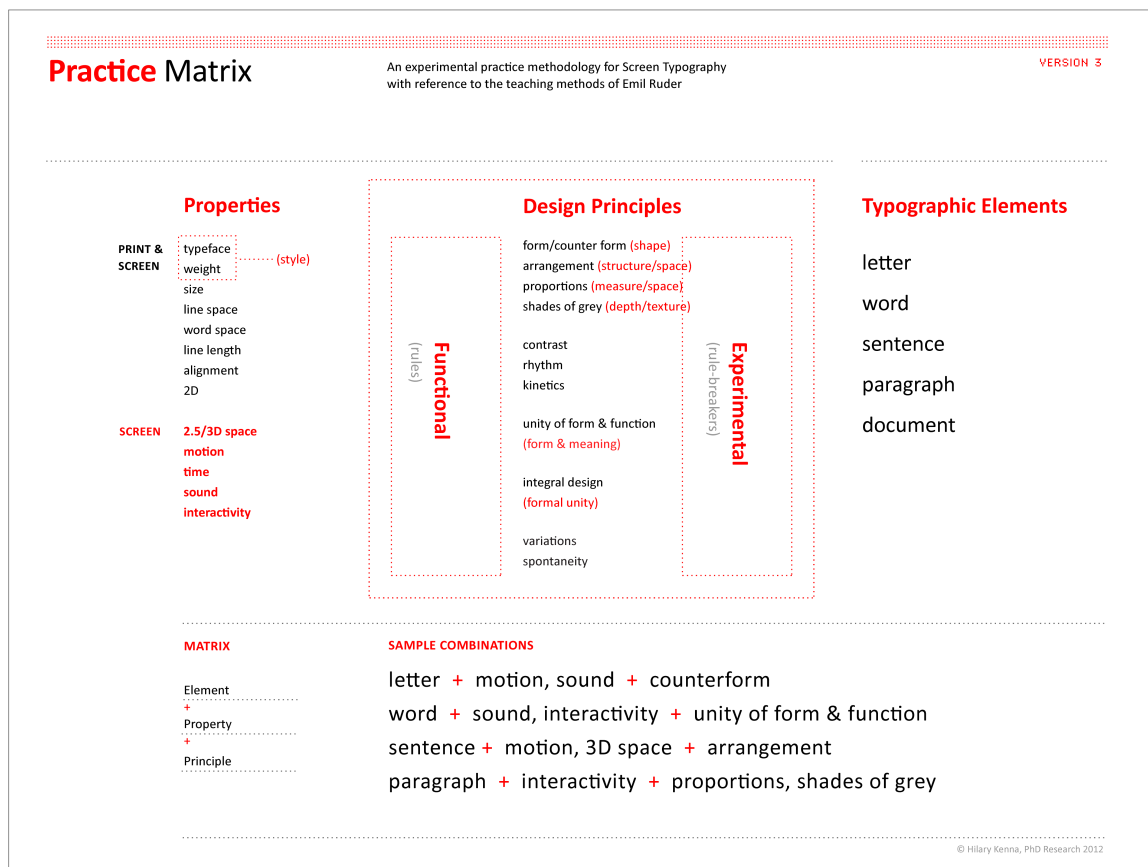
Figure 7.5 Revised version 3 of the *Practice Matrix* for Screen Typography. Properties *typeface* and *weight* are grouped together under style and *timing/temporality* is replaced by time. Qualifying description for *shades of grey* has been modified.

PhD Thesis: Chapter 7: Application and Evaluation of Practice Methodology © Hilary Kenna, 2012.

The matrix was examined again in relation to the properties of screen typography that were identified in chapter 4 (figure 4.119) and some additional refinements were made based on this. Most notably, the list of properties, was condensed into broader headings based on the screen properties diagram (figure 2.6, chapter 2). Further attempts were also made to clarify the description and potential application of the list of design principles. These changes resulted in the current version 4 (figure 7.6) of the *Practice Matrix*.

Figure 7.6 Revised version 4 of the *Practice Matrix* for Screen Typography. The current version shows a rationalised list of properties for print and screen. **Style** replaces *typeface* and *weight*, **measure** replaces *size*, *word space*, *line space* and *line length*, **structure** replaces *alignment* and *2D* and also encompasses *grid* (which was in Ruder's original list, see Figure 6.3), **space** replaces *2D & 3D*. The principle list now indicates which properties they are most appropriately applied to (in parantheses). The current list of properties developed and refined in the practice matrix is illustrated in more details in the diagram below (Figure 4.119).

Professional Practice and Publication

Following the use of the *Practice Matrix* for creating experimental samples, based on elemental aspects of typography (e.g. Letter), an opportunity to apply it to the design of a full text was thought necessary to see whether the matrix was also applicable in a more 'realistic' design context.

In July 2010, the researcher received a commission to design an iPad poetry App, of *The Waste Land* poem by T.S. Eliot (1922), by its joint publishers Faber and Faber, the independent UK book publisher and Touch Press Ltd, a UK/US new media publisher, both based in London.

For the researcher, the opportunity to design *The Waste Land App* (TWL App) presented the first opportunity to apply the matrix to a complete text that would be read on screen (and also to the context of a real design project). The commissioners agreed that the researcher could critically document and publish the design process after the App was released. The PhD supervisory team agreed that *TWL App* could be incorporated into the research as an example of the practice methodology being tested in a professional design context. Irrespective of whether *TWL App* opportunity had arisen, it remained the intention of this PhD to test the methodology in practice and to produce practical outcomes demonstrating this.

The other aspect of designing *TWL App*, which was of major significance to this research was the screen-based publication platform, namely, the iPad. Having just been released in April 2010, the iPad represented a new type of screen that encompassed many of the best advances in screen technology available in other devices such as:

- **high resolution** (132ppi, 1024 x 768) dual orientation display that could be viewed interchangeably in either landscape or portrait mode;

- **portability** – its dimensions were smaller than an A4 page, it was wireless and it weighed 1.5lbs;

- **connectivity** – it had wifi capability for Internet access;

- **rich multimedia** capability to play back high quality sound, video and animation;

- **intuitive interactivity** via its touch screen interface and gestural interaction;

Designing *TWL App*, therefore presented a uniquely emergent screen context in which to apply the research methodology. The *Practice Matrix* was subsequently used during the design process of *TWL App's* development.

In June 2011, it was published for international sale in the US and UK App Stores, where is became 'App of the Week' (USA), and best selling App in the Books category (UK) within a week of its release. Since then, *TWL App* has received over 100 highly positive published reviews, posts and articles by customers, media critics (Lundberg 2011), the popular media (Appleyard 2011), the professional design industry (IXDA 2012), and literary academics (Hammond 2012) in different parts of the world. These include an editorial in the *New York Times* and an extended cover feature in the Culture section of the *London Sunday Times* (June 2011). It also won best adult book at the Book Seller's Future Book Awards in 2011, and was a finalist in the Disruptive Category of the International Interaction Design Association's IXDA Awards in February 2012.

A detailed critical account of designing *The Waste Land App* was written for the peer-reviewed journal *Book 2.0* published by Intellect Publishing (UK) and is due for publication in December 2012. The full account, which is too large to reproduce in the main text of the thesis, is attached as Appendix III. The journal article, entitled, *Touching the text of T.S. Eliot's The Waste Land – a critical discussion of interactive design and screen typography for an iPad e-book*, describes how the *Practice Matrix* was applied to the design of different aspects of *The Waste Land App*.

The *Practice Matrix* was used to aid the design of *TWL App* in three ways, as:

- **Typography and rich media content** – how to integrate different media forms (video, sound) with the main text narrative without breaking the reader's flow and engagement with the narrative; (Kenna, 2012, p. 11)

- **Typography on the screen –** the surface presentation or visual form of the text on screen, in order to create a sustainable on-screen reading experience akin to a paper book, addressing design issues such as composition, layout, hierarchy and legibility on screen; (Kenna, 2012, p.16, 18, 25)

- **Typography and interactivity** – the user interface representation and functionality that enables readers to navigate and interact with the text, as well as other interactive features that provide enhancements unique to the digital reading experience. (Kenna 2012, p.25)

In practice, the Practice Matrix was used as a design tool to test and refine the typographic design of *TWL App* during the design development phase of the project in the a range of different ways, such as:

- **Selection of typefaces and appropriate typographic measure(s**) through critical comparison of a series of visual studies that were conducted to examine the suitability of the letterforms and various settings for screen reading. Matrix formulas such as: 'sentence + style + proportions, shades of grey', 'paragraph + size + arrangement, proportions', 'paragraph + size + proportions, shades of grey' were used for these studies.

- **Development of a grid that would facilitate both orientations of the iPad screen**. Again, multiple iterations dividing the screen in different proportions were carried out in order to derive the optimum most flexible measure for *TWL App's* content. Matrix formulas such as 'text + space + arrangement, proportions + formal unity' were used for this visual development.

- **Design of navigation system and conventions** that facilitated both access to the main sections of *TWL App* and local functionality within each section. Matrix formulas that were used here included: 'document + interactivity + arrangement (hierarchy)' and 'document + interactivity, motion + arrangement, kinetics'. The first formula was applied to functional issues pertaining to the hierarchical structure of navigation – how would the reader move through the different sections of the poem and understand where they were at all times. The second formula focused on the expressive qualities of motion within the typography and graphic elements, through the careful design of how they would move in response to the reader's interaction with the text.

Further detail and illustrations of how the application of the Practice Matrix informed the design process of TWL App is explained in the *Book 2.0* article.

From the critical reflection on designing *TWL App*, articulated in the *Book 2.0* article, a number of key observations have emerged in relation to the *Practice Matrix*, and more generally for the practical methodology put forward by this research. They can be summarised as follows:

- The *Practice Matrix* can be productively applied in professional practice (to a full-text project as opposed to exercises) if the practitioner understands how it fits into the broader context of design and typography knowledge (i.e. they know what each property and principle means, and the basic rules that govern them);

- For experienced designers, the matrix could prove a useful tool for stimulating experimentation with alternative typographic treatments during the design process.

- The *Practice Matrix* is suitable for use by novice designers who are learning the design basics that govern each typographic property and principle, but in this context, the matrix is more a tool for learning the rules, rather than breaking them (as is the case of professional practice);

- The *Practice Matrix* may be more effective in an education and training environment where the process of learning and discovery happens gradually and incrementally, over a longer time period, compared with the short timeframes and fast turnaround of a commercial design studio.

- The *Practice Matrix* requires accompanying documentation – that explains each property and principle and the design basics or rules associated with each – in order to make it understandable and usable by others.

The next and final chapter of this thesis summarises all of the main findings of this research and examines what conclusions can be drawn from them, as well as possible future directions where the research could be further developed.

Chapter 8: Conclusions and Future Work

8.1 Research in an Emergent Field

This research was conducted on a part-time basis, over an eight-year period in an emergent field. During that time, screen typography has undergone significant technological change in its methods of production and consumption. For example, when the research began in 2004, smart phones and touch-screen tablets did not exist, and the availability of typefaces for web design was limited to twelve 'web-safe fonts'. Today, the vast majority of content, that we read and write, is now on screen (via smart phone, tablet and computer) and it is rendered in a multitude of different typefaces made possible by new screen-specific (web and mobile) font formats, licenses and delivery services.

From a practice perspective, the digital tools and techniques for designing screen typography have also evolved during this period, and continue to develop in terms of functionality and complexity. In 2004, creating a web page with HTML/CSS was simpler because the volume of available features for typographic specification and composition were much less than they are today, and the range of available screen devices to display typography was limited primarily to a desktop and laptop computer as mobile phones had very limited capability for rich media content. In 2012, the 'responsive design' of screen typography is a major challenge for designers, in order to ensure the consistent visual presentation and interactive experience of content across all screen platforms.

For the most part, the trajectory of this research has reflected the major technological changes that have occurred in the field, in so far as it has sought to include them within its frame of critical review and practical application. Over the course of the research, the context review, of literature; practice and technology, was updated at regular intervals to ensure that all of the main milestones in technological development were included. The practice-based aspect of the research also addresses current advances in technology as it incorporates the design of an iPad e-book, which is one of the newest screen platforms available (released in 2010).

However, from the outset, this research has noted the difficulty of trying to keep abreast of every technological change within this emergent field, and the hazard of aligning the research to a specific technology or technique, which would soon become obsolete. Therefore, the main findings and contribution of this research may be viewed, not from a technological perspective, but from a design perspective that is critically and conceptually-led and which focuses on screen typography, at an elemental level, in the form of underlying properties and principles for practice.

The original research question, which set the course for this PhD study was a critical and practical exploration of design principles for screen typography. At the conclusion of a lengthy research journey, it is important to state the continued relevance of the original question to this emergent

field. It is also worth noting that despite the intervening period since this research began, that the gap in traditional knowledge when applied in the context of screen typography has remained, while new knowledge in the field continues to be predominantly technical rather than design-led. The final chapter of this thesis presents a digest of the main findings from this research, as a succinct set of points that aims to capture the expanse of territory covered and the research contribution to each area.

8.2 Significance of Practice

The role and significance of practice in this research has proved complex and intricately woven into all facets of this study. During the course of the research, the researcher has sought to understand the nature of practice-related research by reviewing theoretical literature on the subject, and through critical reflection methods applied to the activities of this research. Attempts to clarify the relationship of practice to the research are documented earlier in chapter 1, table 1.1.

Now, at the latter stage of the research journey, it remains the view of the researcher that this study makes a predominantly practice-led contribution to the field of screen typography. That is, its main concerns relate to nature of practice, and the outcomes of the research lead to new knowledge that has operational significance for practice (Candy, 2006). In other words, this research is primarily concerned with the nature of practice in screen typography, and with devising new knowledge, in this case an experimental practice methodology, that has operational significance for how practice in screen typography can be conducted.

While the research incorporates a number of practice-based outcomes (*type4screen* practice blog and experiments; and *The Waste Land App*), these artifacts themselves do not represent the main contribution to new knowledge. Rather, it is the knowledge gained from the process of making, and reflecting on the process of making, these artifacts that has created the valuable contribution of this research (see Appendix III).

The main findings and contribution of this research are concerned with the nature of screen typography practice, and the development of a practice methodology that is operationally significant for that practice. The practice-led contribution of this research is identified in four main areas (figure 8.1) as follows:

- **Defining the field of Practice**

  This research has produced a variety of diagrams (see Appendix V) that contribute to an overall definition of the spectrum field that is screen typography, but which is aptly captured in the properties diagrams of figure 4.119. However, the research has developed valuable definitions for other key aspects including:

the screen environment – types of screens and technologies, generic properties of the screen, types of screen usage and audience behavior and;

typography that exists on screen – classification of different types of typographic work and its associated characteristics or properties;

- **Developing a practice methodology** for designing screen typography (see *Practice Matrix* and draft *Lexicon of Principles*) that incorporates traditional design principles and combines them with other practical principles from screen-native disciplines such as film-making, animation, human computer interaction design, data visualisation, game design etc.

- **Designing examples of screen typography practice** that apply the developed methodology to experimental research samples (*type4screen* research blog and online repository) and a professional commercial project (*The Waste Land App*).

- **Academic writing about screen typography practice** focusing specifically on design issues that will provide additional peer reviewed sources to a relatively small canon of references for other researchers to further develop their own research. The writing outcomes include the following:

peer reviewed journal article in *Design Issues*, MIT Press about how traditional models of practice (such as Emil Ruder's methodology) need to be adapted and updated to address design issues specific to screen media (Kenna, 2010);

peer reviewed journal article in *Book 2.0*, Intellect Publishing that provides a critical account of designing an iPad ebook that applied the *Practice Matrix* during the design process (see Appendix III);

the PhD thesis, which provides a detailed critical examination of design principles for screen typography from a design practitioner's perspective.

The following discussion presents conclusions drawn from the main findings of this research, and presents them in the context of the four main areas of contribution (figure 8.1) illustrated below.

Findings of Practice-led PhD Research Study
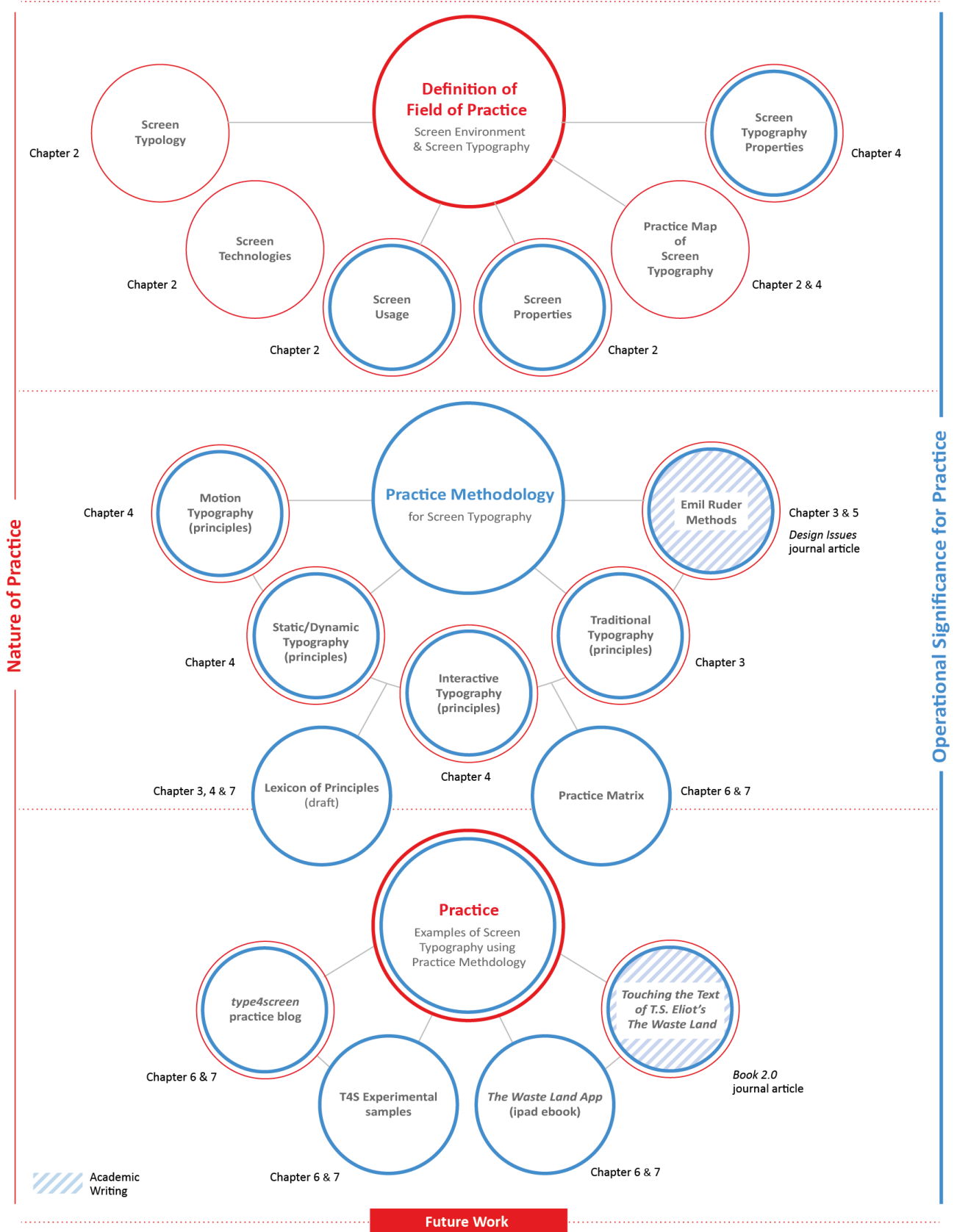
Figure 8.1 Diagram of main research outcomes and findings.

PhD Thesis: Chapter 8: Conclusions and Future Work © Hilary Kenna, 2012.

8.3 Definition of the Field

Summary of Findings

Defining the scope and range of the chosen field was one of the most difficult and time-consuming aspects of this research. The reasons for this are threefold:

1. **Emergent nature of the field**

   The constant introduction of new technologies, tools and techniques meant the field of screen typography was (and is) continually evolving. These changes occurred, and continue to occur as the research happened, making obsolescence a key concern for the research contribution.

2. **Lack of academic literature and research**

   While there is an abundance of contemporary online publishing available, most of this material is informal, and as such includes 'non-verifiable' claims. The main academic sources appear to focus on technical and functional aspects of screen typography (such as technical methods and techniques, or legibility studies) rather than design or aesthetic issues for screen. Relevant to this research, there were few precursors from which to refer. There are no historical anthologies of screen typography practice up to the present day.

3. **Diversity within the field**

   There is a broad range of different types of screens available, and an equally diverse range of typographic work that inhabits them. The methods and approaches to practice for each appear to differ for each one.

Despite the longer time investment, establishing a definition of the field provided the researcher with a much greater understanding of nature of screen typography and the screen environment. In particular, it significantly influenced the path and direction that the research followed towards:

- conceptual practice methodologies such as that of Emil Ruder and;

- the identification of associated screen-native disciplines with relevant practical principles that could be adapted for designing typography on screen.

Conclusions: Definition of Screen Typography

1. The issue of technological obsolescence is a major challenge for making a sustainable research contribution to this field. This research assumed a high-level overview approach, and tried to extrapolate findings that were technologically generic. In other words, the main findings from this research, which define the field – specifically, the nature of the screen environment – provide general definitions for different types of screens, their usage and their underlying properties:

- Definition and properties of what constitutes a 'screen' (figure 2.6)

- Visual typology of types of screens and screen rendering technologies (figures 2.2, 2.3, 2.4)

- Identification of screen usage contexts and associated audience behavior (figure 2.5)

- List of screen properties or characteristics that may be taken to be consistent for all forms of screens in the context of this research (figure 2.6)

2. Key to understanding screen typography is an understanding of the screen environment, its underlying characteristics and usage contexts and also how it differs from print. This knowledge is deemed critical for designers working on screen. In addition to the findings listed above, designers should be aware of:

- Typeface characteristics that are most suited for screen use (table 2.2);

- Key factors affecting legibility of typography on screen (table 2.4).

3. Traditional perspectives of typography are being challenged to recognise that screen typography is part of its spectrum field in which there are many different disciplines or strands of activity. This is evidenced in the practice map (figure 2.7) classification of typographic work on screen into three main overlapping areas of practice: motion typography, static/dynamic typography and interactive typography. Screen typography will continue to present examples of practice that stretch traditional perspectives of what typography is, and over time may in fact reconfigure the discipline itself.

4. Three main design paradigms or approaches may be aligned to each of these areas but they are not exclusive and cross-over each other. Therefore a designer of screen typography needs to have some grounding in each of the three areas:
   - Motion design principles from film-making, motion graphics, classical and experimental animation;
   - Information design principles from graphic and editorial design, information graphics and data visualisation;
   - Interaction design principles from disciplines such as: human computer interaction and user experience design, game design.

5. Because of the steep technical learning curve in each of the different areas of screen typography, many designers tend to specialise in one area, or they work collaboratively as part of a multidisciplinary team. This became evident during the practice review detailed in chapter 4, which identified different leading practitioners in each area.

6. Because of the technological barrier to entry many of the leading design practitioners in screen typography have strong technological skills (Marcos Wescamp, Oliver Richenstein) or come from a technical background (David Small, Ben Fry, Peter Cho, John Maeda). Most are more renowned for their technical rather than aesthetic expertise (Khoi Vinh, Mark Boulton), and in general, are little known in the field of traditional typography.

7. The field is poorly defined from a design perspective because it is emergent, broad, diverse, and for the most part technically driven. There are very few critical texts presenting an overview of the field of screen design and typography (see Literature Map, figure 3.6) and it remains difficult for designers to gain a broad understanding of the role of design within the field. The majority of traditionally published literature either focuses on technical and functional aspects of screen typography, or more general aspects of the design process.

8.4 Practice Methodology for Designing Screen Typography

Summary of Findings

The critical review of technology, literature and practice confirmed the original research question concerning the lack of appropriate practice methodologies for designing screen typography. The research found that:

*   Existing methodologies for typographic design practice primarily address print typography;

*   Other relevant practice methodologies from screen-native disciplines (such as film, animation, interaction design, games etc.) are only partially applicable to screen typography;

*   Current methodologies for screen typography address technical and functional, rather than design aspects of practice.

However this phase of the research also established that screen typography is:

*   a spectrum field of practice with many diverse types of work and methodologies in use (chapter 4, figure 4.1);

*   inextricably linked to the changing nature of digital screen technologies and as such any practice methodology linked to a specific technology would run the risk of obsolescence very quickly.

In this context, the research focused decidedly on conceptual and critical-led approaches to practice (Ruder, 1967) that would remain relevant irrespective of specific changes to screen technologies and methods of production or consumption. The research sought to determine what were the

underlying properties evident in contemporary screen typography practice, and to critically assess what practical design principles were governing them.

In this regard, a comprehensive review of traditional knowledge was conducted in order to extrapolate a core set of widely used typographic design principles that were deemed to be rules of 'best practice' (chapter 3, tables 3.2, 3.3, 3.4). These rules were subsequently used to form the assessment criteria for a critical review of contemporary practice in screen typography (chapter 4).

The course of this examination revealed that:

- The practice of typography varied greatly depending on the screen technology platform and context of use. It ranged from static information typography on the web, to kinetic narrative typography on the cinema screen and a wide range of interactive typography that encompassed bespoke installations, e-books, mobile apps and software applications. The practice methodologies used in contemporary practice were equally varied.

- The most innovative examples of screen typography that were identified blend creative and technical expertise and in many cases, the designer was also the programmer. Therefore, much of the leading work originated outside of the traditional field of design;

- Many of the practitioners whose work featured in the practice review made typographic design decisions based on intuitive aesthetic concerns, or based on the limitations of the technology available, rather than knowledge of traditional typographic design principles.

- Much of the emerging screen work has received notoriety for the quality of its motion design, interactive functionality and technical prowess, rather than for the quality of its typographic design and aesthetics.

Despite these findings however, other results from the practice review are significant for this research, especially when viewed from a practitioner's perspective, because they recognise that:

- Traditional knowledge remained relevant but required adaptation when applied to screen – this adaptation was based on new knowledge gained from the definition of properties of the screen environment and of screen typography, in conjunction with knowledge of the legibility factors affecting typography on screen.

- Traditional knowledge was not comprehensive enough to cover all aspects of screen typography, especially screen specific properties such as: 3D space, motion, time, sound and interactivity.

- New knowledge, to address screen-specific typographic properties was identified in the practice methodologies and principles of existing screen-native disciplines such as film-making, motion graphics, classical and experimental animation, data visualisation, web design, human computer interaction, user experience design and game design.

The main contribution of this research that was developed from these findings is an experimental practice methodology called *Practice Matrix* that incorporates a draft lexicon of design principles for screen typography (chapter 6). It is based on combining identified traditional knowledge (chapter 3) with new knowledge identified in screen-native disciplines (chapter 4) and specifically adapting them to the nature and properties of screen typography (chapter 2 and 4). The proposed methodology was presented for peer review and evaluation (chapter 7) and was iterated based on this feedback. It was also applied in practice, both in an experimental research context and in the commercial context of professional practice. Its current form is sufficiently developed to further apply and test its practice with other designers. This objective represents a key next step for the future development of this research.

Conclusions: Practice Methodology

1. There remains a need for design-led practice methodologies for screen typography that address both traditional and screen-specific properties.
   This research attempts to make a contribution to this need in the form of an experimental practice methodology called *Practice Matrix* (chapter 6, figure 6.5 and chapter 7, figure 7.6) and a draft lexicon of associated principles (chapter 6, table 6.5). Both are at early stage development and require further application, testing and evaluation.

2. New practice methodologies for screen typography will need to combine existing knowledge (from traditional typography) with new knowledge from other screen-native fields (film-making, motion graphics, classical and experimental animation, data visualisation, web design, human computer interaction, user experience design and game design).

   While it was not possible to address all of these practical disciplines within the scope of this research, critical feedback about the methodologies they use, and about the *Practice Matrix,* was sought via a core set of interviews with experienced practitioners in a number of these disciplines (see chapter 4 and 7, tables 7.3 - 7.8).

3. New practice methodologies for designing screen typography should not be aligned to a specific technology, because they run the risk of becoming obsolete very quickly in the screen environment where there is constant technological change.

   The practice methodology proposed by this research does not present reference to specific technical methods or techniques, rather it offers a set of screen typographic properties and a suite of associated design principles that can be selected from, and adapted to suit the needs of different typographic design contexts.

4. Practice methodologies that are conceptually and critically-led offer a more sustainable contribution to the field.

    The evidence for this is borne out of existing practice methodologies from traditional typography and other screen-native disciplines, that remain relevant to, and widely used in, contemporary practice in their respective fields. These methodologies, (Ruder, 1967), (Dair, 1967), (Bringhurst, 2001), (Tufte, 1990), (Johnson & Thomas, 1981), (Blair, 1994), (Katz, 1991), (Schneidermann, 1987), were identified in the literature (chapter 3) and practice review (chapter 4) and through interviews with experienced practitioners (chapter 4 and 7) in both design and screen-native disciplines.

5. There is a need for academic publishing about design practice and the critical analysis of design practice and methodologies in the field of screen typography.

    Most designers, working in screen typography, write about their practice (and area of specialisation) informally through online publication. Contemporary discussion and critique of current design practice on screen generally lacks the rigour of academic peer-reviewed publication, or empirically proven research. This observation was also a key finding in the literature review of traditional typography (chapter 3) and is perhaps more due to the tacit nature of how knowledge is gained and transferred within this practical field. This research aims to make an academic contribution to the critical documentation of practice and practice methodologies in screen typography, through this PhD thesis, and through the *Book 2.0* journal article, *Touching the Text of T.S. Eliot's The Waste Land* (Kenna, 2012), which presents a critical account of the design process for *The Waste Land App*.

6. This research particularly notes the emerging area of 'responsive design' as already having major implications for the design of content for screen (see Part B: Static/Dynamic Typography in chapter 4).

    The culture of screen media (coming from Internet publishing and television) has led to a dramatic change in the nature of textual content, reading behavior and modes of consumption. There is an insatiable appetite for new information that can be accessed anywhere and anytime. Reading attention spans are getting shorter and interactive choices are enabling audiences to effectively edit their own content selections. Designers now need to conceptualise typographic compositions that become manifest in multiple different forms, subject to the choices made by the reader, and also depending on the type of screen device they use to access that content. The need for design methodologies that address multiple possible outcomes is therefore another inherent requirement of potential new models of practice.

The *Practice Matrix* proposed by this research offers a menu of choices that may go some way towards addressing this requirement, but which requires further application and testing in the context of a 'responsive design' problem. This is a key area for future research.

7. Developing a practical methodology for screen typography is difficult because the field is emergent, diverse and technically complex.

   The development of any new methodology requires application in practice, testing, evaluation and iteration. Once there is a working draft of the methodology (or *Beta version*, as it is called in software development), then formal testing and evaluation, using systematic research methods, can be undertaken. This process requires significant time and resources, and is worthy of a separate study. This research has been primarily focused on what, and how, to develop a new practice methodology for screen typography. The proposed methodology, comprising the *Practice Matrix* and a draft lexicon of principles, is only approaching the Beta stage of development at the concluding stages of this research study, and as a result it has not yet been formally or empirically tested. This has been identified as a next step in the future development of this research.

8.5 Practice in Screen Typography

The practice-based aspect of this research primarily focuses on the application of the *Practice Matrix* methodology to two screen design contexts:

- experimental research samples (*type4screen* experiments) – which represent the design exploration of a typographic element (letterform) and;

- a professional commercial project (*The Waste Land App*) – which encompasses the design of a full interactive text.

Additionally, the practical outputs from this research, includes the design and development of the *type4screen* practice blog. Each practice-based outcome has made a significant knowledge contribution to this research.

The *type4screen* practice blog

The *type4screen* practice blog was designed as a mechanism to store, document and publish practical experiments for this research. However, from a screen typography perspective, it also provided an opportunity to learn the new technologies (HTML(and PhP)/CSS and WordPress) and to apply the practical knowledge and methodologies learnt during the course of this research. Through the practical design and production of the *type4screen* practice blog, the researcher

experienced first hand the practical issues and problems highlighted in the written part of this research. The researcher encountered considerable technical difficulties during the translation of the typographic design into HTML(PhP)/CSS WordPress templates, and had to seek external technical support to fix bugs in the final realisation. The reason it proved so difficult was because the *type4screen* practice blog was a bespoke design, and it did not fit within existing WordPress design themes or templates from either a functional (interactive features) or formal (visual presentation) perspective. This accurately reflects the discussion about the HTML/CSS method discussed in chapter 4. In its present form, the *type4screen* practice blog is not as typographically refined as it was originally conceived in the design mock-ups, simply because it was too technically difficult to realise.

Conclusions:

1. This experience underscores how the practice of screen typography is utterly dependent on a combination of both design and technical expertise for its realisation, and how in most cases, this necessitates the skills of more than one person.

2. Despite these technical difficulties, the *type4screen* practice blog provides of a platform and methodology in which to house and document future research practice samples that apply the *Practice Matrix* and lexicon of principles in practice.

type4screen Experiments

The development and application of the practice methodology proposed by this research, in the form of the *Practice Matrix* and lexicon of principles, is still in its infancy, and as such requires much greater experimentation and application than what has been achieved in this research to date.

- The practice samples, comprising ten letterform experiments, generated for this research are demonstrative of how to use the practice methodology and therefore represent only an initial sampling of the potential possibilities offered by using the *Practice Matrix*.

- Because they only focus on one matrix formula selection:
  letterform + motion, sound + counterform, contrast
  they show that it is possible to generate multiple iterations based on exploring a limited set of typographic properties and design principles.

The samples, created by the researcher, do not test:

- the usefulness of the proposed methodology in helping other designers to understand design principles for screen typography or;

- whether or not, it improves their practical design skills for making screen typography.

Conclusions

- In order for the *Practice Matrix* to be further developed, and applicable beyond the personal practice of the researcher, it requires systematic application and testing with a larger group of practitioners. An ideal scenario would be a practical trial with a student group, at different stages in their education (first year, second year, third year) when their knowledge is at different stages (beginner, intermediate, advanced).

  In an educational context:

- It would be possible to create practical exercises that explore a wider range of different typographic elements, properties and principles in order to produce a broader set of practical experiments for critical comparison;

- It would be possible to build up knowledge of properties and principles incrementally over time and the *Practice Matrix*, the lexicon of principles, and the *type4screen* practice blog, would facilitate this type of practical application.

The application and testing of the *Practice Matrix* in an educational setting, represents a key opportunity for the further development of this research in future work and which was not possible to fit within the scope of the existing study.

The Waste Land App

The Waste Land App (TWL App) represents a comprehensive practice example of screen typography in the form of an interactive digital poetry book delivered on the iPad screen device.

The researcher used the *Practice Matrix* comprehensively during the design process of TWL App to test its application in the context of designing a full on-screen text. A detailed critical account of designing TWL App is due for publication in December 2012, as a peer-reviewed article in the academic journal *Book 2.0* (see Appendix III).

Conclusions

- It is an early example of screen typography practice as an iPad e-book, due to its publication date (June 2011) just ten months after the iPad was released (April 2010).

- The *TWL App* demonstrates that the *Practice Matrix* can be successfully applied in a professional practice context to a commercial project, and not just to the experimental context of education and research. However, for the methodology to work effectively, the practitioner must understand how it fits into the broader context of design and typography knowledge (i.e. they know what each property and principle means, and the basic rules that govern them). The methodology can also be a useful tool for stimulating experimentation with alternative typographic treatments during the design process.

- In the context of the practice map (figure 4.1), *TWL App* would be situated in the interactive typography sphere, but in reality (as is the case with much screen typography practice), it combines design knowledge paradigms from the other spheres, which in this case is static/dynamic typography.

- The iPad represents a new breed of mobile touch screen computers with rich media capability, high resolution, an intuitive interface (touch screen) and a content sales channel (App store). The iPad typifies the latest development in screen technologies and associated audience behavior. Touch screen tablet computers and e-readers are also becoming the fastest growing platform for e-books and screen reading (Wisenbart, 2012). From the perspective of designing screen typography, these types of screens offer a high quality, interactive publishing medium that encompasses all of the screen properties identified in this research (figure 2.6, and figure 4.119). This also means that designing typography on these screens requires practical knowledge that addresses these properties.

- The journal article in *Book 2.0* contributes to the small canon of peer-reviewed literature about the critical review of design practice for screen typography. The article identifies three core themes under which to examine the typography and design of e-books; rich media content, surface presentation and digital innovation (i.e. innovation that is not possible in paper books).

- The practice of designing *TWL App* confirmed some other findings of this research as follows: that the process of making screen typography requires creative and technical expertise to realise the design

  The typographic design may not appear as refined as originally intended in its final digital realisation on screen, because crafting of finer typographic details (letter, word and line spacing, use of baseline grids, etc.) is time-consuming and requires technical knowledge.

8.6 General Observations about Practice

The culmination of findings from the literature and practice review, coupled with the practical endeavours of this research to apply the methodology proposed by this research have also led to some more general findings and observations about the nature of practice as follows.

- As per the practice map (figure 4.2), the boundaries of each of area of screen typography practice are blurring and overlapping. Motion typography is commonplace on the web and interactivity is slowly becoming a feature of traditional broadcast mediums.

- New areas of screen typography that encompass programming, data processing and visualisation, as well as spatial and environmental concerns, are emerging in contemporary practice and will necessitate even more creative and technical demands of designers in these spheres.

- Collaborative design teams appear to be the favoured model for this type of leading edge practice but it highlights the ongoing issue of balancing design and aesthetic concerns with technological know how and implementation.

- There also appears to be considerable debate in contemporary practice as to whether designers should be trained in programming and technological aspects, or if programmers and technologists should be taught the principles of design and typography. Author and design critic, Jessica Helfand suggests it is more likely that a new breed of digital designers will be 'techno-aesthetes' (Helfand, 2001). A discussion topic 'Do designers need to be able to code?' on the Interaction Design Association's (IXDA) LinkedIn Group forum generated almost 500 responses (Bhattarai, 2011). Other studies, such as *Defining the Designer of 2015*, which was jointly undertaken by Adobe Corporation and AIGA (American Institute of Graphic Designers) rate technology skills below traditional design and aesthetic visualisation skills, and creative problem solving, in a list of top 13 competencies for designers. Other researchers such as Joyce Yee, whose PhD study focused on typographic education in a digital media context (Yee, 2006), pose central questions about what appropriate level of technical skills are required of a designer working on screen. While authors such as Steven Heller (Heller, 2001) and Teal Triggs (Triggs, 2003) have also examined how digital media tools and processes have impacted upon the contemporary practice of typography.

- Despite all of the technological aspects associated with screen typography, it appears that design and typographic aesthetic sensibility remains the key skill to be brought forward from the traditional field of practice. Based on the traditional context, it is not a skill that can be learnt quickly but one that is based on accumulated knowledge and experience nurtured through a deeper understanding of traditional principles applied in practice.

- It should be possible to derive a broadly accepted, criteria for 'good' screen design based on further analysis of, and combining:
  – knowledge for best practice in traditional typography
  – knowledge for best practice from screen-native disciplines
  – knowledge of the legibility factors for screen.

The key challenge for screen typography is how to integrate and adapt traditional knowledge with new skills for screen and how to apply them in different screen contexts.

8.7 Core Knowledge Competencies for Screen Typography

Based on the key findings of this research mapped onto the main areas of screen typography identified in the practice map (figure 4.2), what follows is a list of core knowledge competencies and skills required of designers working in these areas of screen typography.

General Screen Environment

- Understanding of the screen environment, its properties, usage and audience behaviour in relation to typography;

- Understanding of the diversity of practice within the field of screen typography and the associated design approaches and principles for each of the three main areas;

- Knowledge and understanding of the main factors affecting legibility of typography on screen in each of the three areas of practice.

Motion Typography

Motion typography is primarily a narrative based form of screen typography that requires a blend of knowledge from traditional design and typography with new knowledge from film-making and animation, coupled with a solid understanding of the relevant production technologies and screen delivery platforms. The new skills required include:

- knowledge of the principles of storytelling and how to achieve design and narrative integration;

- ability to visualise a time-based sequence before production, in the form of storyboards and animatics;

- understanding of film grammar, editing and continuity of camera movement;

- a grasp of animation principles to improve quality and aesthetics of motion;

- a combination of knowledge from animation and film-making about the integration of sound and image including: sound breakdown, sound-image synchronisation, timing and editing;

- ability to conceptualise, visualise and implement composition in a 3D virtual space;

- technical competency to realise visual concepts on screen through the use of animation, editing and compositing software.

Static/Dynamic Typography

Static/Dynamic typography is primarily information based and requires a combination of traditional typography skills from editorial and publishing design combined with knowledge of web design, information design and technical production methodologies. The skills required include:

- principles of information design including methods of ordering and organisation, hierarchical and non-hierarchical structures, navigation systems, visualisation techniques and use of colour;

- ability to visualise information architecture and navigation routes;

- ability to make paper, wireframe and high-fidelity prototypes;

- a strategic understanding of the Internet as a communications medium different to print; (characteristics, benefits and advantages, shortcomings, pitfalls)

- understanding of the different areas of practice within web design, such as brochure-ware, an e-commerce site, and social media sites etc., and the typographic conventions that are associated with them;

- knowledge and understanding of HTML/CSS, ability to prototype page designs and create CSS style sheets in order to specify detailed typographic formatting

- understanding of the technical issues and limitations of the web such as WC3 standards, resolution, file types and graphics optimisation, use of web fonts.

Interactive typography

Interactive typography represents typography that is driven through the interface or interactive experience of the information or content. It may combine motion and static/dynamic typography but with specific emphasis on interactivity. The knowledge and skills listed for motion and static/dynamic typography are applicable here, as well as a core understanding of interaction design principles and methods that include:

- user research and requirements gathering: interviews, focus groups, usability roundtables, usability tests;

- interaction and user experience visualisation methodologies such as: wireframes, task flows, storyboards, rapid prototyping;

- interaction design models such as: cognitive frameworks, interface paradigms and user experience patterns and how they can be applied to typography;

- software development process and life cycle including agile and waterfall methods, differences between development stages (pre-alpha, alpha, beta etc.), iterative feedback and modification, etc.

8.8 Future Work

This research has had a major impact upon the professional practice of this researcher in the following ways:

- It has provided training in formal research methodologies that have enabled the researcher to become a professional researcher and to understand the relationship of research and practice and how to write about practice-based research.

- Through developing visualisation methodologies used in this research, the researcher's professional practice has moved from being a full-time educator to being a full-time researcher focused on the product design and development of data visualisation tools.

- This PhD study has engaged peer-review of the ideas, practical methods, and practice outcomes of this research through journal publication and conference presentation.

- It has enriched the teaching practice of the researcher by incorporating ideas from this research into the classroom, and through trying out some of the findings in the course of daily teaching practice.

- It has enabled the researcher to become a research supervisor of two MRes students.

- The expertise gained over the course of this research has enabled opportunities such as the commission to design *The Waste Land App,* as well as invitations to speak at national and international conferences.

The cumulative effect of this impact has enabled the researcher to identify areas of future research and in some cases to realise the mechanism by which to undertake this research.

Through the course of this research, the researcher has identified future work in a number of related areas that require further study:

1. Historical

Screen typography practice – this rapidly evolving field is producing volumes of work at phenomenal speed that is published online with a seemingly short life span due to changing technologies and the general appetite for new content that permeates the culture of screen media. Important examples of screen typographic work are being produced without any critical analysis before the work is archived, or rendered inaccessible by technical obsolescence. Effectively, the history of screen typography practice is being published every day, but is disappearing just year on year with each new technological advancement. Currently, there is no historical design anthology of screen typography that presents a critical review of practice in the field.

The legacy and influence of Emil Ruder, Armin Hoffman and The Basel School of Design on graphic design and typography is partially documented and referred to in a small selection of literature

(Hollis,), (Schmid,), (McKoy,), (Juan). This subject is worthy of detailed critical study because of the seemingly timeless relevance of the modernist methods and approaches developed at Basel that are still in use today. More detailed examination of the aesthetics, philosophies and influences behind the practice methodologies developed at Basel could reveal significant findings for contemporary practice.

2. Educational Methods and Pedagogy

The practice methodology proposed by this research appears suited to the context of design education and training in screen typography. However, it requires practical application and formal testing in the studio classroom environment to further assess its viability and to identify if it has potential for integration into a teaching environment. The researcher plans to run a pilot study with students on the Visual Communication programme at IADT (where the researcher teaches) using the research methodology developed by this PhD. This pilot will necessitate designing a practice-based workshop based around the methodology including: developing a set of practical exercises, documenting the results, critically evaluating the outcomes, gathering feedback from the participants and publishing the results in an academic research forum.

3. Methodological Research

One of the key difficulties of this research was the relationship of writing and practice-based research. The tension between text-based written research, and image-based practice research is acknowledged in the literature about practice-led and practice-based research. However, most practice-related research (including this PhD study) is still reliant on the written word as a major part of its submission and validation in making a contribution to new knowledge. There is a need for more exemplars that present alternative methods for publishing practice-related research and for more critical debate for acceptance of such new methods by established academia. The use of visualisation techniques in practice-based research is of particular interest to this research as a topic for future publication.

4. Experimental Practice

The practice methodology proposed by this research was used to create only a small set of experimental practice samples. The potential for further experimentation using the *Practice Matrix* is a key area of future practice that the researcher plans to undertake. The researcher aims to populate the *type4screen* practice blog with a broader set of samples, which will help to demonstrate and explain the proposed practice methodology to others. Through a broader set of practice references, the researcher hopes to publish additional critical studies of smaller detailed

design aspects of screen typography. Through publication and presentation, the researcher also aims to promote the methodology for use by other designers, and to invite them to contribute samples to the *type4screen* practice blog.

Final Comment

This research set out to examine the practical principles for designing screen typography in a rapidly changing technological and emerging context, where traditional knowledge gaps were perceived to exist with respect to designing for screen. Despite an expansive discovery period, the research managed to stay focused on the original question and to achieve its original aim of contributing new knowledge in the form of a definition of the field and the development of a practice methodology for designing screen typography. At times, the scope of the research territory appeared overwhelmingly diverse and technically complex, but once these difficulties were acknowledged rather than solved, the focus on a design-led study ensured that the research developed a sustainable approach.

This study has achieved the goal of solving a problem that was originally identified in the researcher's professional practice as an educator and designer, but which was quickly validated as a universal problem. The research has produced a set of findings and outcomes, which aim to move the debate forward in this emerging field in four ways, by providing:

- **an emerging definition of the field of practice** – including a definition of 'screen' in relation to typographic practice, an overview of the history and origins of typography on screen, identification of the design properties of screen typography, and classification of types of practice in screen typography;

- **an experimental practice methodology** – that has been peer reviewed and which incorporates traditional design principles (from Emil Ruder) adapted for screen, as well as new design principles that address screen aspects (3D space, motion, time, sound, and interactivity) of typography;

- **a set of practical exemplars** – that demonstrate how the methodology can be applied in practice; through the provision of an online repository which may be used by others in the future; and through an example of an iPad e-book which may represent the type of prevalent digital form that screen based books will take in the future.

- **academic writing on design issues relating to screen typography** – two peer reviewed articles have resulted from this research that focus specifically on aspects of design practice for screen typography. These publications, in conjunction with this PhD thesis, will provide other researchers (from both technical and creative disciplines) with some additional peer-reviewed sources in a relatively small canon of material, from which to further develop their own related research.

The findings of this research are independent of specific technology, and therefore hopefully ensure they make an early sustainable contribution to this relatively immature, but rapidly changing field that currently has few precursors.

This research has opened up a range of new and additional research questions that will provide a foundation for ongoing research in the field of screen typography.

Appendix I: Bibliography

A List Apart, *The Web Design Survey* (April, 2007), A List Apart, New York, USA.

Abbott Miller, J., (1998), Dimensional Typography – Case Studies on the Shape of Letters in Virtual Environments, Princeton Architectural Press.

Abrams J., (ed.), (1999), IF/Then:Play, Distributed Art Publishers (DAP).

Aicher, O, (1988), Typographie, Ernst & Sohn, Berlin.

Alexander. C, Issikawa, S., & Silverstein, M., (1977), A Pattern Language: Towns, Buildings, Construction, Oxford University Press.

Allsopp, J., (April 2000), A Dao of Web Design, A List Apart article, http://www.alistapart.com/articles/dao/ (accessed: 21.11.11)

Ambrose, G. & Harris, P., (2003), The Fundamentals of Creative Design, AVA Publishing, London.

Ambrose, G. & Harris, P., (2005), Basic Design: Fromat, AVA Pulishing, London.

Ambrose, G. & Harris, P., (2005), Basic Design: Layout, AVA Pulishing, London.

Ambrose, G. & Harris, P., (2005), Basic Design: Typography, AVA Publishing, London.

Ambrose, G. & Harris, P., (2006), The Fundamentals of Typography, AVA Publishing, London.

Ambrose, G. & Harris, P., (2008), Basic Design: Grids, AVA Publishing London.

Anderson, D.M., (1961), Elements of Design, Holt, Rinehart, Watson, New York.

Apeloig, P., (2001), Au Coeur du Mot/Inside the Word, Lars Müller Publishers, Switzerland.

Apple Corporation Inc., (February 2010), App Design Strategies, IOS Human Interfaces Guidelines, http://developer.apple.com/library/IOs/#documentation/UserExperience/Conceptual/MobileHIG/AppDesign/AppDesign.html (accessed: 10.09.2010).

Apple Corporation Inc., (February 2010), iPad User Experience Guidelines, http://uxmag.com/articles/ipad-user-experience-guidelines (accessed:07.01.2012).

Apple Corporation Inc., (February 2010), User Experience Guidelines, IOS Human Interfaces Guidelines, http://developer.apple.com/library/IOs/#documentation/UserExperience/Conceptual/MobileHIG/UEBestPractices/UEBestPractices.html#//apple_ref/doc/uid/TP40006556-CH20-SW1 (accessed: 10.09.2010).

Appleyard, B., (June 26, 2011), iPads, e-books and T.S. Eliot, Sunday Times, http://www.bryanappleyard.com/ipads-ebooks-and-t-s-eliot/ (accessed 24.05.12)

ATypI (2004), Type and typography Textbooks required by educators on the ATypI, Educators List, Discussion Summary, Association Typographique Internationale (ATypI).

Bain, E., (1970), Display Typography, Focal Press, London.

Bain, E., (1970), The Theory and Practice of Typography, Hastings House.

Baines P. & Haslam A., (2002), Type & Typography, Laurence King.

Baines, P. & Dixon, C., (Summer 2001), Times Classic: design analysis, Eye Magazine, V.10, 40.

Baines, P., (Summer 2001), Face lift: new cuts at the Times, Eye Magazine, V.10, 40.

Barrett, E and Bolt, B (2007) Practice as Research: Approaches to Creative Arts Enquiry, London: IB Taurus.

Bartram, A., (2006), Futurist Typography and the Liberated Text, Yale University Press.

Bauman & Bauman, (2005), Pictowords: Semantic Typography, Arthur Niggli,

Beaird, J., (2007), The Principles of Beautiful Web Design, Site Point (2nd edition 2010).

Beirut M., Helfand J., Heller S. & Poynor R., (1999), Looking Closer 3 – Classic Writings on Graphic Design, Allworth Press.

Bellantoni J. & Woolman M., (1999), Type in Motion – Innovations in Digital Graphics, Thames and Hudson.

Bellantoni J. & Woolman M., (2000), Moving Type – Design for Time and Space, Rotovision SA.

Bennett, Alan (12 July 2009), Margate's shrine to Eliot's muse, The Guardian, http://www.guardian.co.uk/books/2009/jul/12/ts-eliot-margate-shrine (accessed: 25.11.11).

Bennett, N., (January 2007), Poetry in Motion, Digital Arts Online, (www.digitalartsonline.co.uk/), (accessed 04.06.07).

Bhattarai R., (July 2011), Do Designers need to be able to code?, discussion topic on IXDA Linked In Group,
http://www.linkedin.com/groupItem?view=&gid=3754&type=member&item=63925606&commentID=-1#lastComment

Bias R, Larson K., Huang S., Aumer-Ryan P., Montesclaros C., (April 2010), An exploratory study of visual and psychological correlates of preference for onscreen subpixel-rendered text, Journal of the American Society for Information Science and Technology, 61 (4), John Wiley & Sons, Inc.

Biggs, J., (1968), Basic Typography, Faber and Faber, London.

PhD Thesis: Appendix I: Bibliography © Hilary Kenna, 2012.

Biggs, M., Büchler D., (2007), Rigor and Practice-baed Research, Design Issues, 23, no. 3, pp62-69.

Biggs, M., Büchler D., (2008), Eight criteria for practice-based research in the creative and cultural industries. Art, Design & Communication in Higher Education 7:1, 5-18

Biggs, M., Rendell, J., Rust, C., & Friedman, K., (2007), Four position papers from the AHRC Review of Practice-Based Research:

http://aces.shu.ac.uk/ahrc/ahrcreview/positionpapers/positionpapers.html

Bignens C, Bossard H. R. & Flieschmann G., (1999), Max Bill: Typography Advertising Design, Verlag Niggli, Switzerland.

Bill M., (1946), Über Typografie.

Birdsall D., (2004), Notes on Book Design, Yale University Press.

Blackwell, L., & Carson, D., (1995), The End of Print: The Graphic Design of David Carson, Lawrence King Publishing.

Blackwell, L., (1998), 20th Century Type Remix, Laurence King Publishing.

Blair, P., (1994), Cartoon Animation, Walter Foster Publishing Inc.

Block B., (2001), The Visual Story – Seeing the Structure of Film, TV and New Media, Focal Press.

Boardley J., *15 Examples of Excellent Web Typography, Part 1* (2007), *2* (2007*) & 3* (2008), *www.ilovetypography.com,* Kagawa, Japan, (accessed 05.01.08).

Bolter, J. David, (2001), Writing space: computers, hypertext, and the remediation of print, Lawrence Erlbaum Associates.

Bolter, J., & Gromala, D., (2003), Windows and Mirrors, Interaction Design, Digital Art and the Myth of Transparency, MIT Press.

Boneu, A. & Solana, G., (2007), Uncredited – Graphic Design and Opening Titles in Movies, Index Books, S. L., Barcelona.

Bosoni G., Campana M. & von Moos S., (2006), Max Huber, Phaidon Press.

Bossard H., (2000), The Typographic Grid, Arthur Verlag Niggli, Switzerland.

Boulton, M., (2009), A Practical Guide to Designing for the Web, Mark Boulton Design, UK.

Bowers J., (1999), Introduction to Two-Dimensional Design: Understanding Form and Functions, Wiley and Sons, New York.

Brakage S., (1989), Film at wit's end – eight avant-garde film-makers, Polygon.

Bridle, J., (October 2011), The New Value of Text, blog post on booktwo.org, http://booktwo.org/note-book/the-new-value-of-text/ (accessed: 20.12.11)

Bringhurst, R., (2001), The Elements of Typographic Style v2.4, Hartley and Marks.

Britisha Film Institute, (2001), Britain in the Thirties, The History of the Avant Garde series, British Film Institute.

Brockbank A. and McGill, I. (2007), Reflection and Reflective Practice, Facilitating Reflective Learning in Higher Education, London: McGraw-Hill.

Brockie, A., (Nov 2011), The Guardian iPad edition: Put the newspaper on the iPad, The Guardian Online, http://www.guardian.co.uk/media/gallery/2011/oct/13/guardian-ipad-edition-design-evolution (accessed:07.01.2012).

Brodwell D. & Thompson K., (1993), Film Art – An Introduction, Mc Graw Hill Inc.

Broos, K., & Quay, D., (2003), Wim Crouwel: Alphabets, Amsterdam.

Brownie, B., (2012), The Behaviours of Fluid Characterforms in Temporal Typography, Unpublished PhD Thesis, University of Hertfordshire.

Burgin, V. (2006). Thoughts on 'research' degrees in visual arts departments. Journal Of Media Practice, 7(2), 101-108. doi:10.1386/jmpr.7.2.101_1

Burke, C., (1998), Paul Renner: The Art of Typography, Hyphen Press, UK.

Burke, C., (2008), Active Literature: Jan Tschichold and New Typography, Hyphen Press, UK.

Burns, A., (1961), Typography, Reinhold, New York.

Buxton, B., (2007), Sketching User Experiences: Getting the Design Right and the Right Design (Interactive Technologies), Morgan Kaufman.

Calder, B.J. (1977), Focus Groups and the Nature of Qualitative Marketing Research, Journal of Marketing Research. Volume 14. Number 3. Pages 353 to 364.

Cameron, Andy, (Winter 1998), The Medium is Messy, Eye Magazine, V8, 30.

Candy, L., (2006), Practice Based Research: A Guide, Creativity & Cognition Studios, University of Technology, Sydney, http://www.creativityandcognition.com (accessed: 26.08.12)

Card, S., Mackinlay, J., & Shneiderman, B., (1999), Readings in Information Visualization: Using Vision to Think, Morgan Kaufmann.

Carr, N., (July/August 2008), Is Google making us stupid?, Atlantic Magazine, http://www.theatlantic.com/magazine/archive/2008/07/is-google-making-us-stupid/6868/, (accessed: 30.11.11)

Carter, R., (1997), Working with Computer Type 4 - Experimental Typography, Rotovision.

Carter, R., (2002), Digital Colour and Type, Rotovision.

Carter, R., Day B. & Meggs P., (1993), Typographic Design: Form and Communication, second edition, John Wiley and Sons, Inc. New York.

Chandler, S. B., (2001), Comparing the legibility and comprehension of type size, font selection and rendering technology of onscreen type, Unpublished Thesis, Virginia Polytechnic Institute and State University.

Cheng K., (2006), Designing Type, Laurence King, London.

Chermayeff I., & Geismar T., (2006), Watching Words Move, Chronicle Books.

Cho P., (1999), Computational Models for Expressive Dimensional Typography, Unpublished MSc/MA Thesis, Massachusetts Institute of Technology, USA.

Clair K., Busic-Snyder C., (2005), A Typographic Workbook: A Primer to History, Techniques, and Artistry, 2nd Edition, John Wiley and Sons, Inc, New York.

Clarke, A. & Holzschlag, M., (2006), Transcending CSS: The Fine Art of Web Design, New Riders Press, (technical editors: Boulton, M. & Gustafson, A.)

Codrington A., (2003), Kyle Cooper, Laurence King Publishers, UK.

Coles, S., (April 2010), What the iPad is Missing, FontFeed, http://fontfeed.com/archives/ipad-typography (accessed 28.09.10)

Collingridge, P., (February 2010), App Analytics, conference presentation at Tools of Change for Publishing, O Reilly TOC Conference, New York. http://www.youtube.com/watch?v=KOFLlZ9HH8w (accessed 11.12.11)

Cook, C., Heath, F., Thompson, R. L., (2000), A Meta-Analysis of Response Rates in Web- or Internet-Based Surveys, Educational and Psychological Measurement, Sage, Volume 60, Issue 6, pp.

Cooper, C., Reimann, R., Cronin, D., (2007), About Face 3: The Essentials of Interaction Design, Wiley.

Cotton B., (1994), The Cyberspace Lexicon – An Illustrated Dictionary of Terms, Phaidon, UK.

Craig J., (1971), Designing with Type: a basic course in typography, New York Watson Guptill.

Craig J., (1990), Basic Typography: a design manual, New York Watson Guptill.

Crampton Smith G., (January 2007), *Designing a Better Life*, Creative Review, January 2007 Issue.

Crawford, C., (2002), Chris Crawford on Game Design, Prentice Hall PTR

Crawford, C., (2004), Chris Crawford on Interactive Storytelling, New Riders.

Cross, N., (2001), Designerly Ways of Knowing: Design Discipline Versus Design Science, Design Issues, 17, no. 3, pp49-55.

Dair C, (1967), Design with Type, University of Toronto Press.

Denastas, A. & Gallet, C., (2006), An Initiation in Typography, Verlag Niggli AG, Switzerland.

Diexmann T. & Gremmler T., (2003), Grids for the Dynamic Image, AVA Publishing SA, Switzerland.

Dillon A., (1992), Reading from paper versus screens: a critical review of the empirical literature, Ergonomics 35 (10): 1297-1326.

Dillon A., (1994), Designing Usable Electronic Text, London, Taylor & Francis.

Dobbs, D., (Sept 2010), Is page reading different from screen reading?, Wired Magazine, http://www.wired.com/wiredscience/2010/09/36037/ (accessed: 29.11.11)

Donald A Schön, (July 1988), Editorial, Design Studies, Volume 9, Issue 3, Pages 130-132.

Donald Schön, (1985), The Design Studio: An Exploration of Its Traditions and Potentials, Intl Specialized Book Service Inc.

Donald Schön, (1995), The Reflective Practitioner: How Professionals Think in Action, Ashgate Publishing; New edition edition.

Donald Schön, (January 2001), Donald Schön's Philosophy of Design and Design Education, Springer Netherlands, International Journal of Technology and Design Education, Vol. 11, 1.

Dondis, D. A, (1974), A Primer of Visual Literacy, MIT Press.

Doney, J., (December 2003), *Typographic Specification – what graduating students should know*, Research Study Report, University of Plymouth. Somerset College of Arts & Technology and International Society of Typogrpahic Designers.

Dowding, G., (1995), Finer points in the spacing and arrangements of type, Hartley & Marks, USA, revised edition.

Dredge, S., (August 8, 2012), The Waste Land iPad app earns back its costs in six weeks on the App Store, The Guardian, http://www.guardian.co.uk/technology/appsblog/2011/aug/08/ipad-the-waste-land-app (accessed 24.05.12)

Drennan D. & Heller, S., (1997), The Digital Designer, Watson-Guptill Publications, New York.

Drucker, J., (1994), The Visible Word – Experimental Typography and Modern Art 1909 – 1923,University of Chicago Press

Duckett, J., (2011), HTML and CSS: Design and Build Websites, Wiley.

Durling, D, Friedman, K., Gutherson, P., (2003) 'Debating the Practice-Based PhD.' Design Science and Technology, vol. 10, no. 2, 7-18, Europia Publishing, France. http://aces.shu.ac.uk/ahrc/ahrcreview/positionpapers/friedman1.html

Dyson M. C. & Gregory J., (2003), Typographic Cueing on Screen, Visible Language, VL 36.3

Dyson M. C. & Kippling G. J., (1998), The Effects of Line Length and Method of Movement on Patterns of Reading from Screen, VL32.2.

Dyson, M., (2001), The influence of reading speed and line length on the effectiveness of reading from screen, International Journal of Human Computer Studies, Issue 6, p. 585-612, Academic Press.

Dyson, M., (2002), Legibility on screen: what do we think versus what do we know?, Proceedings of the 1st international conference on Typography and Visual Communication, Thessaloniki, Greece, 26-30 June 2002, Thessaloniki: University of Macedonia Press, 2004, 249-256.

Dyson, M., (2004), How physical text layout affects reading from screen, Behaviour and Information Technology, November-December Vol. 23, Issue 6, p377-393, Taylor and Francis Group.

Eisenstein, S., (1986 paper edition), The Film Sense, Faber and Faber, London (originally published 1943).

Elam K., (2001), Geometry of Design: Studies in Proportion and Composition, Princeton Architectural Press.

Elam K., (2004), Grid Systems: Principles of Organising Type, Princeton Architectural Press.

Elam, K., (2007), Typographic Systems, Princeton Architectural Press.

EPub3.0 Specification, (January 2012), http://idpf.org/epub/30/spec/epub30-overview.html#sec-intro-overview, The International Digital Publishing Forum (IDPF). (accessed 20.01.12)

Ernst, S., (1977), The ABC's of Typography, Art Direction Book Co, New York.

Evans, S., Le Grice, M., (2001), The state of the art: research in the practical arts – doctorates – autonomous methodologies, European Journal of Arts Education (U.K.), vol.3, no. 2-3, pp. 105-13.

Ezer, O., (2009), The Typographer's Guide to the Galaxy, Die Gestalten Verlag, ISBN 13- 978-3899552423

Faber L. & State Design, (1998), Replay: Ultimate Games Graphics, Laurence King.

Faber L. & Walters H., (2004), Animation Unlimited – Innovative Short Films since 1940, Laurence King Publishing

Fawcett-Tang, R. (ed.), (2007), New Typographic Design, Yale University Press.

Felici, J., (2002), The Complete Manual of Typography, Adobe Press, USA.

Firmage, R., (2001), The Alphabet Abecedarium – some notes on letters, paperback edition, Bloomsbury Publishing.

Forty, A., (1992), Objects of Desire: Design and Society Since 1750, Thames and Hudson.

Franz, L., (2011), Typographic Web Design: How to Think Like a Typographer in HTML and CSS, Wiley.

Frascara J. & Solomon M., (1996), Typographic Thought: Fontana Chair, Interfaces series from Edicial, South America.

Frayling, C. (1993), 'Research in Art and Design', Royal College of Art Research Papers [1]. London: Royal College of Art, http://www.scribd.com/doc/73904052/Christopher-Frayling-Research-in-Art-and-Design

Friedberg, A., (2006), The Virtual Window: from Alberti to Microsoft, MIT Press.

Friedman, D., (1994), Dan Friedman: Radical Modernism, Yale University Press, New Haven.

Friedman, V., (October, 2007), The Showcase of Big Typography, Smashing Magazine, (accessed, 22.10.07).

Friedrich, F., Ott, N. & Stein, B., (ed.), (1998), Typography – When, Who, How, Könemann, Germany.

Frutiger, A., (1980), Type Sign Symbol, ABC Books, Zurich.

Fry, B., (2007), Visualizing Data: Exploring and Explaining Data with the Processing Environment, O'Reilly Media.

Fuel, (1997), Pure Fuel, Watson-Guptill Publications.

Gatto, J.A., (1987), Exploring Visual Design, Davis Publications, Worcester Mass.

Gere, C., (June 2006), Geanealogy of the computer screen, Visual Communication, Sage Publications, vol. 5, no. 2, pp. 141-152.

Gerstner, K. M. & Kutter, M., (1959), Die Neue Graphik, Teufen: Niggli.

Gerstner, K. M., (1974), Compendium for Literates, MIT Press, Cambridge, Massachusetts, USA.

Gerstner, K., (2001), Karl Gerstner: Review of 5 x 10 Years of Graphic Design etc., Hatje Cantz Verlag, Germany.

Gerstner, K., (2007), Designing Programmes, Lars Müller Publishers, Switzerland (original text 1964).

Gill B., (1988), An Essay on Typography, Lund Humphries, 5th edition, UK, (original text 1930).

Gillespie, J., (2002), Fonts for the Web, Web Page Design for Designers (www.wpdfd.com).

Gillet, F. (April 2012), Tablets Will Rule The Future Personal Computing Landscape – A BT Futures Report, Forrester Research.

Gluth S., (1999), Roxanne – A Study in Visual Factors Effecting Legibility, Visible Language, VL33.3.

Glynn, D. (1985), Science and Perception as Design, Design Studies 6:3, Elsevier.

Gonález de Cosío M. & Dyson M. C., (2003), Methodology for Manipulating Electronic Documents in Relation to Information Retrieval, Visible Language, VL 36.3

Gottschall, E., (1998), Typographic Communications Today, London, MIT Press.

Götz, V., (1998), Colour and Type for the Screen, Rotovision.

Götz, V., (2002), Grids for the Internet and Other Digital Media (E-design S.), AVA Publishing.

Götz, V., (2003), Typo Digital, Rowohlt Taschenbuch Verlag.

Grabinger, R. S. & Amedeo, D., (1988), CRT text layout: Perceptions of viewers, Computers in Human Behaviour, 4, pp. 189–205.

Graver, A. & Jura, B., (2012), Best Practices for Graphic Designers, Grids and Page Layouts: An Essential Guide for Understanding and Applying Page Design Principles, Rockport Publishers.

Gray, C. (1996), Inquiry through practice: developing appropriate research strategies, International Conference on Art and Design Research: No Guru, No Method, 4-6 September 1996, University of Art and Design Helsinki (UIAH).

Gray, C., Malins, J., (2004) Visualizing Research: a guide to the research process in Art and Design, Ashgate, UK.

Greenhaulgh, P., (ed), (1997), Modernism in Design, Reaktion Books, USA.

Griffiths, K., (1993), Abstract Cinema, Documentary, Channel 4.

Halas J., (1987), Masters of Animation, BBC Books.

Hall, P. & Soar, M., (2006), *Motion Graphics – Images over Time*, Eye, Vol. 15, 60.

Hammond, A., (April 17, 2012), How Faber and Faber's iPad app rescues T.S. Eliot's masterpiece from the waste land of print, Toronto Review of Books, http://www.torontoreviewofbooks.com/2012/04/how-faber-and-fabers-ipad-app-rescues-t-s-eliots-masterpiece-from-the-waste-land-of-print/ (accessed 24.05.12)

Hanson M., (2004), The End of Celluloid: Film Futures in the Digital Age, Rotovision.

Harkins, M, (2011), Basics Typography: Using Type, AVA Publishing.

Hart, C., (1998), Doing a Literature Review: Releasing the Social Science Research Imagination, Sage Publications Ltd, London.

Haseman, B. (2006) A Manifesto for Performative Research. Media International Australia incorporating Culture and Policy, theme issue "Practice-led Research"(no. 118):pp. 98-106.

Haslam A., (2007), Book Design, Laurence King Publishers.

Heibert K. J., (1998), Graphic Design Sources, Yale University Press.

Helfand J., (2001), Screen: Essays on Graphic Design, New Media and Visual Culture, Princeton Architectural Press.

Helfand, J., (2001), *Freedom in the Graphic Galaxy*, Eye, Vol. 10, 39, pp.8-9.

Helfand, J., (2001), *Minimalism/Maximalism: The New Screen Aesthetic*, in Screen: Essays on Graphic Design, New Media, and Visual Culture, Princeton Architectural Press, USA.

Heller S. (ed), (1998), The Education of a Graphic Designer, Allworth Press.

Heller S. (ed), (2001), The Education of an E-Designer, Allworth Press.

Heller S. (ed), (2003), Teaching Graphic Design, Allworth Press.

Heller S. & Meggs P., (ed), (2001), Texts on Type – Critical Writings on Typography, Allworth Press, New York.

Heller S., (2004), The Education of a Typographer, Allworth Press, New York.

Heller S., & Anderson, G., (2012), New Modernist Type, Thames and Hudson.

Heller, S. & Dooley, M., (ed), (2008), Teaching Motion Design, Allworth Press, New York.

Heller, S., (Autumn 2004), Scott Stowells, Open brings innovation, style and plain speaking to broadcast design, Eye Magazine, V.14, 53.

Hendel, R., (1998), On Book Design, Yale University Press.

Higgins H., (2009), The Grid Book, MIT Press.

Hiebert, K., (March, 2007), *Timeline Confusion* – customer review of Richard Hollis' book Swiss Graphic Design: The Origins and Growth of an International Style, 1920-1965, on http://www.amazon.ca/Swiss-Graphic-Design-International-1920-1965/dp/0300106769 (accessed: 4/11/07)

Hill B., (1999), Osprey: The Magic of Reading, Microsoft research paper, Microsoft Advanced Reading Technologies Research Group (also presented at Poynter Type conference, November 2004, Florida USA).

Hilner M., (2009), Basics Typography: Virtual Typography, AVA Publishing, UK.

Hochuli J. & Kinross R., (1996), Designing Books – practice and theory, London, Hyphen Press.

Hochuli J., (1987), Detail in Typography, Compugraphic Corporation, USA (reprinted by Hyphen Press, 2008).

Hochuli, J., (2002), Jost Hochuli: Printed Matter, Mostly Books, Arthur Niggli Ltd.

Hockenberry, C., Put Your Content in My Pocket (Part I & II), A List Apart articles, http://www.alistapart.com/articles/putyourcontentinmypocket, (accessed: 21.11.11)

Hoefler, J (1997), On Classifying Type, Emigré 42.

Hoffman, A., (1965), Graphic Design Manual - Principles and Practice, Alec Tiranti Ltd.

Hollis, R., (2006), Swiss Graphic Design – The Origins and Growth of the International Style 1920-1965, Laurence King Publishers, UK.

Holt M., & Muir H., (2005), 8vo On the Outside, Lars Müller Publishers, Switzerland.

Hopkins, P., (Dec., 2007), Thinking Critically and Creatively about Focus Groups, Area , Vol. 39, No. 4 pp. 528-535, Blackwell Publishing on behalf of The Royal Geographical Society (with the Institute of British Geographers)

Hurlburt, A., (1977), Layout The Design of the Printed Page, Watson-Guptill Publications, New York.

Hyde, K., & Warwicker, J., (2002), Mmm…Skyscraper I Love You: a Typographic Journal of New York, Booth-Clibborn Editions.

International Digital Publishing Forum, (October 2010), Industry Statistics, http://idpf.org/about-us/industry-statistics (accessed 22.05.12)

Ishii, H., (Autumn 2003), MAS 834 Tangible Interfaces, Course Notes.

Ishii, H., (Spring 1997), MAS 837 Collaboration between People, Computers and Things, Course Notes.

Itten, J, (1963), Design & Form – The Basic Course at the Bauhaus, Thames and Hudson.

Jacob, H., (ed) & Warde, B., (1955), The Crystal Goblet: Sixteen Essays on Typography, Sylvan Press, London.

James-Garret, J., (2010), The Elements of User Experience: User-Centered Design for the Web and Beyond, New Riders Press, (2nd Edition).

Jubert R., (2007), Typography and Graphic Design: From Antiquity to the Present, Flammarion.

Jury D., (2004), About Face – Reviving the rules of typography, Rotovision.

Jury D., (2006), What is typography?, Rotovision.

Jury, D., (Summer 2001), Why Helvetica?, Eye Magazine, V.10, 40.

Kahn P. & Kenk K., (2001), Mapping Websites, Watson-Guptill Publications.

Kandinsky, W., (1910), Concerning the Spiritual in Art.

Kandinsky, W., (1926), Point and Line to Plane, Dover Publications, 1979 New Ed, edition.

Kandinsky, W., (1979 new edition), Point and Line to Plane, Dover Publications, (original text 1926).92

Kane, J., (2002), A type primer, Laurence King Publishing.

Karamath, A., (2001), Overtures and Psychotic Symphonies, Eye, Vol. 10, 39, pp.42-49.

Karamath, J., (Spring 2001), Overtures and Psychotic Symphonies, Eye Magazine, V.10, 39.

Katz S. D., (1991), Film Directing – Shot by Shot, Visualizing from Concept to Screen, Michael Wiese Productions.

Kelly, K. (November 2008), Idea Lab: Becoming Screen Literate, New York Times Magazine, http://www.nytimes.com/2008/11/23/magazine/23wwln-future-t.html?pagewanted=1, (accessed: 3.12.11).

Kelly, K., (June 2000), We still turn pages, Time Magazine, http://www.kk.org/writings/time_turn_pages.php, (accessed: 3.12.11)

Kenna, H., (2010), *Emil Ruder: A Future for Design Principles in Screen Typography*, Design Issues, MIT Press, Winter Issue, 2010, pp.35-54.

Kepes, G., (1967), Language of Vision, Paul Theobald and Company, Chicago (originally published 1944).

Kepes, G., (ed.), (1965), Education of Vision, Studio Vista, London.

Keyes, R., (2006), The Impact of Moore's Law, Solid-State Circuits Newsletter, IEEE, Vol:20:3 pp. 25 – 27.

King, E., (Summer 2001), Digital Type Decade, Eye Magazine, V.10, 40.

Kinross R., (ed), (2000), Anthony Froshaug: Texts on Type Vol. 1, Documents of a Life Vol. 2, London: Hyphen Press.

Kinross, R., (2002), Unjustified Texts – Perspectives on Typography, Hyphen Press, London.

Kinross, R., (2004 edition), Modern Typography – an essay in critical history, Hyphen Press, London.

Kirkham, P., (1995), Saul Bass and Billy Wilder: In Conversation, Sight and Sound, Vol.5, 6, pp.18-21.

Klanten R., (ed.), (2001), 72dpi, Die Gestalten Verlag.

Klanten, R., Bourquin, N., (ed.) & Ehmann, S. (ed.), (2008), Data Flow: Visualising Information in Graphic Design, Die Gestalten Verlag.

Klee, P., (1925), Pedagogical Sketchbook.

Koffka, K., (1935), Principles of Gestalt Psychology, Harbinger Books, NewYork.

Kolko, J., (2011), Exposing the Magic of Design: A Practitioner's Guide to the Methods and Theory of Synthesis (Human Technology Interaction), Oxford University Press, USA.

Kolko, J., (2011), Thoughts on Interaction Design, Morgan Kaufmann; 2nd edition.

Krasner, J., (2008), Motion Graphic Design – Applied History and Aesthetics, Focal Press.

Kristof R. & Satra A., (1993), Interactivity by Design - Creating and Communicating with New Media, Adobe Press.

Krug, S., (2005), Don't Make me Think, New Riders Press, 2nd Edition

Kunz, W., (1998), Typography: Macro and Micro Aesthetics, Verlag Niggli AG.

Kunz, W., (2004), Typography: Formation and Transformation, Verlag Niggli AG.

Lane, J., & Lommen, M., (2003), Bram de Does: Book Typographer and Type Designer, De Buitenkant, Amsterdam.

Lanham R., (2006), The Economics of Attention, University of Chicago Press, USA.

Larson K. (Summer 2004), The Science of Word Recognition, Eye Magazine, Vol 13, 52.

Larson, K., van Dantzich M., Czerwinski M., Robertson G., (April 2000), Text in 3D: some legibility results, CHI '00 – Conference on Human Factors in Computing Systems, The Hague, The Netherlands.

Laurel B., (1996), Computers as Theatre, Addison Wesley.

Laurel B., (ed.), (1990), The Art of Human Computer Interface Design, Addison Wesley.

Le Corbusier, (1954), The Modulor, Faber, London.

Le Grice, M., (2001), Experimental Cinema in the Digital Age, British Film Institute, UK.

Leher, J., (Sept 2010), The Future of Reading, Wired Magazine, http://www.wired.com/wiredscience/2010/09/the-future-of-reading-2/, (accessed: 29.11.11).

Lewis, J., (1963), Typography: basic principles, Studio Books, London.

Lewis, J., (1978), Typography: Design and Practice, Barrie and Jenkins, London.

Linderman, M., (June 2007), *Fireside Chat: Jonathan Harris, Aaron Koblin, and Marcos Weskamp (Part 1 of 2)*, Signals v's Noise, 37signals design and technology weblog (accessed 20.06.07).

Lissitzsky, E. & Arp, H., (1924), The Isms of Art 1914–124

Lucke K., (1998), Customised Digital Books on Demand: Issues in the creation of a flexible document format, VL32.2.

Lundberg, J., (June 10, 2011), Raising the Bar for Digital Poetry, The Huffington Post, http://www.huffingtonpost.com/john-lundberg/raising-the-bar-for-digit_b_874764.html, (accessed: 24.05.12)

Lupton, E. & Cole Phillips, J., (2008), Graphic Design Basics, Princeton Architectural Press, New York.

Lupton, E., (2004), Thinking with Type – A critical guide for designers, writers, editors and students, Princeton Architectural Press, New York.

MacLeod, K., & Holdridge, L., (2004) The Doctorate in Fine Art: The Importance of Exemplars to the Research Culture, International Journal of Art and Design Education. pp.155-168.

Macmillan, N., (2006), An A–Z of Type Designers, Laurence King Publishers, UK.

Maeda J, (August, 2003) DBN website (http://dbn.media.mit.edu/whatisdbn.html), (accessed 20.06.07).

Maeda J. & Reiman R., (Nov/Dec 2002), Perspectives: Learning Curves, Edesign Magazine.

Maeda J., (1994–1998), Reactive Books Series: The Reactive Square, Flying Letters, Tap Type Write, published on cd-rom and floppy disk.

Maeda J., (2000), Maeda @ Media, Thames and Hudson.

Maeda J., (2002), Essay on Design Education for Takenaka Corporation's Approach Magazine, Japan.

Maeda J., (Autumn 1997), MAS 962 Digital Typography Principles, Course Notes (weeks 1–10).

Maeda J., (March 2000), MAS 964 Principles of Visual Interface Design, Course Notes (weeks 1–12).

Maeda J., (March to August 1995), Essays on Time Graphics, MdN Magazine, Japan.

Maier, M., (1977), Basic Principles of Design, Van Nostrand, Reinhold, New York.

Malcom, D.C., (1972), Design: Elements and Principles, Davis Publications, Worcester Mass.

Malsy V., Teufel P. & Gejko F. (ed), (2007), Helmut Schmid: Design is Attitude, Birkhäuser, Switzerland.

Manovich L, (1999), *Avant Garde as Software*, for inclusion in forthcoming book Info-Aesthetics: Information and Form, www.manovich.net, (accessed 01.10.07).

Manovich L, (2002), *Generation Flash*, for inclusion in forthcoming book Info-Aesthetics: Information and Form, www.manovich.net, (accessed 01.10.07).

Manovich L., (2001), The Language of New Media, MIT Press.

Marashall K. (April 2007), TypoTopo, research report for *Transliteracies Project: Research in the Technological, Social, and Cultural Practices of Online Reading*, University of California, USA.

Marcotte, E., (March 2009), Fluid Grids, A List Apart article, http://www.alistapart.com/articles/fluidgrids/, (accessed: 21.11.11)

Marcotte, E., (May 2010), Responsive Web Design, A List Apart article, http://www.alistapart.com/articles/responsive-web-design/ (accessed: 21.11.11)

Marinetti, F. (1909), Futurist Manifesto.

Marshall, L. & Meachem, L. (2012), How to Use Type, Laurence King Publishing, UK.

Mayer H., (1968), Publication by Edition and Works by Hansjörg Mayer, Germany.

Mc Cloud, S., (1993), Understanding Comics, Harper Perennial, N.Y.

Mc Cloud, S., (February 2009), Infinite Canvas, blog post, http://scottmccloud.com/4-inventions/canvas/index.html, (accessed: 30.11.11)

Mc Coy, K. & M., (ed.), (1990), Cranbrook Design: The New Discourse, Rizzoli International Publications.

Mc Coy, K. (2005), Another 60s Revolution: *Rob Roy Kelly brings Swiss design education to the U.S. at the Kansas City Art Institute 1964-1974*, AIGA Conference, *Schools of Thought 2*.

Mc Laren, N., (1991), Norman Mc Laren: Selected Films, National Film Board of Canada.

Mc Lean R., (1997), Jan Tschichold – A Life in Typography, Princeton Architectural Press.

Mc Lean, R., (1980), The Thames and Hudson Manual of Typography, Thames and Hudson, London.

McCandless, D, (2010), Information is Beautiful, Collins.

McWilliams, D. & Dionne C., (1993), Creative Process: Norman Mc Laren, National Film Board of Canada.

Meggs, P., (1998), A History of Graphic Design, John Wiley & Sons, third edition.

Milanesi, C., & Cozza R., (March 2012) Forecast: Media Tablets by Operating System, Worldwide, 2010-2016, 1Q12 Update, Gartner Inc.

Mills, C. B. & Weldon, L. J., (1987), 'Reading text from computer screens', ACM Computing Survey, 19, pp. 329–358.

Miniwatts Marketing Group, (June 2011) World Internet Users and Population Stats, Internet World Stats website, (accessed: 23.06.2011).

Mitchell M. & Wightman S., (2005), Book Typography – A Designer's Manual, Libanus Press, UK.

Mod, C., (April 2010), Embracing the Digital Book, Essay, http://craigmod.com/journal/e-books/, (accessed: 30.11.11)

Mod, C., (January 2011), A Simpler Page, http://www.alistapart.com/articles/a-simpler-page/, (accessed: 30.11.11)

Mod, C., (June 2011), Post artifact books and publishing, http://craigmod.com/journal/post_artifact/, (accessed: 30.11.11)

Mod, C., (March 2010), Books in the age of the iPad, http://craigmod.com/journal/ipad_and_books/, (accessed: 30.11.11)

Mod, C., (September 2011), The shape of our future book, Essay, http://craigmod.com/satellite/our_future_book/, (accessed: 30.11.11)

Moholy-Nagy L., (1969), Vision in Motion, Paul Theoboald and Company (1st edition, 1947).

Morgan, D.L. (1996), Focus Groups as Qualitative Research, Sage, p.13.

Morison S, (1930), First Principles of Typography, The Fleuron: A Journal of Typography, Cambridge: Cambridge University Press.

Moritz, W., & Keefer, C., (1998), The Films of Oskar Fischinger, Vol. 1, Jack Rutberg Fine Arts Inc. 357 N. La Brea Ave., Los Angeles.

Morridge, B., (2006), Designing Interactions, MIT Press.

Morville, P., (2006), Information Architecture, O'Reilly Media, 3rd Edition.

Muller, L., (2005), Helvetica – Homage to a Typeface, Lars Müller Publications, Switzerland.

Mulller-Brockman J., (1961), The Graphic Artist and his design problems, Verlag Arthur Niggli, Switzerland.

Mulller-Brockman J., (1981), Grid Systems in Graphic Design: A Visual Communications Manual, Verlag Arthur Niggli, Switzerland (1st edition, 1968).

Mutter, P. & Maurutto, P., (1991), Reading and skimming from computer screens: The paperless office revisited, Behaviour and Information Technology, 10 (4), pp.257–266.

Neil, T. & Scott, B. (2009), Designing Web Interfaces: Principles and Patterns for Rich Interactions, O'Reilly Media.

Neil, T., & Scott, B., (2009), Designing Web Interfaces, O'Reilly Media.

Neilsen, J., (May 2011), iPad Usability: Year One, Alert Box, http://www.useit.com/alertbox/ipad.html (accessed: 07.01.2012).

New York Times, Editorial, (June 11, 2011), 'The Waste Land' by App, http://www.nytimes.com/2011/06/12/opinion/12sun4.html?_r=2&smid=tw-nytimesopinion&seid=auto (accessed 11.06.11).

Newbury, D. (1996), Knowledge and Research in Art and Design, Design Studies, 17 (2), 215–9.

Newbury, D. (1996), Research Perspectives in Art and Design, Birmingham: The Research Training Initiative, University of Central England.

Nicolai, C., (2009), Grid Index, Die Gestalten Verlag.

Nielsen J., (2000), Designing Web Usability, New Riders Publishing.

Noordzij, G. (2000), Letterletter: an inconsistent collection of theories that do not claim any other authority than that of common sense, Hartley and Marks, Point Roberts, Wash.

Norman D. A., (1988), The Psychology of Everyday Things, Basic Books.

Owen, W., (Autumn 1994), *Design in the age of digital reproduction*, Eye, Vol.4, 14, pp26-39.

Owen, W., (Autumn 1994), Design in the age of digital reproduction, Eye Magazine, V4, 14.

Patmore, C., (2003) The Complete Animation Course – the principles, practice and techniques of successful animation, Thames and Hudson.

Perfect, C., (1992), The Complete Typographer: a manual for designing type, Little Brown, London.

Phinney T., *Web Fonts Standards: Web Designers Feedback Survey,* and *Web Fonts Standards: Font Vendors Feedback Survey* (November, 2007), Adobe Corporation, USA

Pierce J., (ed.), (1994), Human Computer Interaction, Addison Wesley.

Polanyi, M., (1958), The Personal Knowledge – Towards a Post-Critical Philosophy, Routledge & Kegan Paul, London.

Poynor R., (October 2005), Keynote speech: Reluctant Discipline: Graphic Design History's Protracted Birth, Conference: New Views – Repositioning Graphic Design History, London College of Communication, University of the Arts London. Unpublished notes.

Poynor, R., (1991), Typography Now – The Next Wave, Booth-Clibborn Editions.

Poynor, R., (1998), Typography Now 2 – Implosion, Booth-Clibborn Editions.

Prowse L., (Autumn 2007), Grow your own, Eye, Vol. 17., 65.

Purcell K., (2006), Josef Müller Brockmann, Phaidon Press.

Quelhas, V., (2004), *Typography and Sound*, unpublished MA thesis and project (www.dyntypo.com), University of Arts Porto, Portugal.

Quinn, S., (March 2005), Eight Things You Can Do Now to Improve On-Screen Legibility, Poynter Online.

Quinn, S., (March 2005), In Search Of: The Best Online Reading Experiences, Poynter Online.

Rafaeli A., (2005), Book Typography, New Castle, Delaware.

Re M., Drucker J. & Mosley J., (2003), The Art of Matthew Carter: Typographically Speaking, Princeton Architectural Press.

Rees A.L., (1999), A History of Experimental Film and Video, British Film Institute.

Reichenstein, O., (April 2010), Designing for iPad: Reality Check, Information Architects (iA Inc). http://informationarchitects.jp/designing-for-ipad-reality-check/ (accessed 28.09.10)

Rendgen, S., Wiedemann, J., (Ed.), (2012), Information Graphics, Taschen GmbH; Har/Pstr M edition.

Resnick, E., (2003), Design for Communication: Conceptual Graphic Design Basics, John Wiley and Sons, Inc, New York.

Richmond R., (Winter 2007*), The Look of Web 2.0*, Eye, Vol. 17, 67.

Riggs, T. & Grieshaber, J., (2009), Typeface: Classic Typography for Contemporary Design, Princeton Architectural Press, New York.

Rigley, S., (2012), *Graphic Design Readings Lists – How should we choose texts to guide students through the info-blizzard?,* Eye blog, www.eyemagazine.com/blog/post/graphic-design-reading-lists (accessed: 30.08.12).

Robert R. & Starr C., (1976), Experimental Animation – Origins of a New Art, A DA CAPO Paperback.

Roberts, R., (1966), Typographic Design, Ernest Benn, London.

Robson, C. (2002) Real World Research: A resource for social scientists and practitioner-researchers. 2nd ed. London: Blackwell.

Rogers R., (ed.), (2000), Preferred Placement – Knowledge Politics on the Web, Jan Van Eyck Akademie.

Romero, J., (January 1995), Le Louvre: Paintings and Palace CDROM Review, in CultureKiosque: The European Magazine of Arts, Culture and Ideas Worldwide, (www.culturekiosque.com/art/CDROMs/ra1louv.htm) (accessed 10.06.07).

Rosen, B., (1963), Type and Typography: The Designer's Type, Van Nostrand Reinhold, New York.

Ruder, E., (1952), On Drinking Tea, Typography, Historicism, Symmetry and Asymmetry Typographische Monatsblätter (TM), 2.

Ruder, E., (1952), Typo-compositions, an attempt, Typographische Monatsblätter (TM), 2.

Ruder, E., (1960), *Typography as Communication and Form*, Typographische Monatsblätter, TM 1971-3.

Ruder, E., (1967), Typographie: a manual for design, Arthur Niggli Ltd, Switzerland.

Rüegg R. & Frohlich, G., (1972), Basic Typography: Handbook of Technique and Design, ABC Verlag, Zurich.

Rüegg R., (1989), Basic Typography: Design with Letters, Van Nostrand Reinhold, New York.

PhD Thesis: Appendix I: Bibliography © Hilary Kenna, 2012.

Rust, C. and Wilson, A. (2001). A visual thesis? techniques for reporting practice-led research. Designjournalen,, 8 (1), 23-29.

Rust, C., (2004), Tacit Knowledge and Invention in Science, Design Issues, Vol. 20 Issue 4, p76-85, 10p.

Rust, C., Motram, J., Till, J., (2007), Review Report: Practice-Led Research in Art, Design and Architecture, Arts and Humanities Research Council (AHRC) Research Review, UK.

Saffer, D., (2009), Designing for Interaction: Creating Innovative Applications and Devices, New Riders Press; 2nd edition.

Saltz, I., (2009), Typography Essentials: 100 Design Principles for Working With Type, Rockport, USA.

Samara, T., (2002), Making and breaking the grid: a graphic design layout workshop, Rockport, Gloucester, Mass.

Samara, T., (2006), Typography Workbook – A Real-World Guide to Using Type in Graphic Design, Rockport, Gloucester, Mass, New edition.

Sandhaus L., Signs of Graphic Design Found in New Media Programs, AIGA Round Table Discussion, publish on AIGA's Design Educators Community, http://designeducators.aiga.org/de_education/de_newmedia_programs, (accessed 02.10.07).

Sassoon, R., (2002), Computers and Typography 2, Intellect.

Sausamarez, M., (1964), Basic Design – the dynamics of visual form, London Studio Vista.

Schmid H., (2006), Armin Hoffman – Compositions in Typography, Baseline 49.

Schmid H., (Ed), (1997), The Road to Basel – typographic reflections of the students of typographer and teacher Emil Ruder, Osaka.

Schmid H., (ed), (March 2009), Ruder Typography, Ruder Philosophy, IDEA 333, Toyko.

Schmid, H., (1981), Typography Today, Seibundo Shinkoshna Publishing Co., Japan.

Schmid, H., (2002), Emil Ruder: Typography from the Inside, Baseline *36, 1*, pp.5-12.

Scholz C., (2001) Relations Between Sound Poetry and Visual Poetry: The Path from the Optophonetic Poem to the Multimedia Text, Visible Language, VL35.1.

Search, P., (2003), The Metastructural Dynamics of Interactive Electronic Design, Visible Language, VL 37.2.

Shaw, J. & Weibel, P., (ed), (2003), Future Cinema: The Cinematic Imaginary after Film, MIT Press.

Shneiderman, B., (1987), Designing the User Interface: Strategies for Effective Human-Computer Interaction, Addison-Wesley, 1st Edition.

Shneiderman, B., Plaisant, C., Cohen, M., & Jabobs, S., (2009), Designing the User Interface: Strategies for Effective Human-Computer Interaction, Addison-Wesley, 5th Edition.

Sifry D., (April 2007), The State of the Live Web, Blogosphere Quarterly Report, Technocrati, (accessed 23.08.07).

Simon, H., (1969), The Sciences of the Artificial, Cambridge MA: MIT Press.

Simon, O., (1945), Introduction to Typography, Faber and Faber, London.

Small D., (1996), Navigating Large Bodies of Text, IBM Systems Journal, Vol. 35, Nos. 3 & 4.

Small D., (1999), Rethinking the Book, Unpublished PhD Thesis, Massachusetts Institute of Technology, USA.

Smeijers F., (1996) Counterpunch: making type in the sixteen century, designing type now, Hyphen Press.

Smeijers F., (2003) Type Now, Hyphen Press.

Sobchack V., (1999) Nostalgia for a Digital Object: Regrets on the Quickening of QuickTime, Millennium Film Journal No. 34 (Fall 1999): The Digital

Solomon, M., (1986), The art of typography: an introduction to typo.icon.ography, Watson-Guptill, New York.

Sonolli, L., (2006), Letteremix, Tassinari/Vetta, Italy.

Speikerman E. & Ginger EM., (1993), Stop Stealing Sheep – and find out how type works, Adobe Press.

Spencer, H. (ed), (1982), Liberated page: an anthology of major typographic experiments of this century as recorded in 'Typographica' magazine, Lund Humphries, London.

Spencer, H., (1969), Visible Word, Lund Humphries in association with the Royal College of Art, London.

Spencer, H., (1987), Pioneers of Modern Typography, Lund Humphries, London.

Squire, V., (2006), Getting it right with Type, Laurence King, London.

Stark Adam, P., Edmonds R. & Quinn S., EyeTrack 07 Study for Print and Online News (April 2007), Poynter Institute, Florida, USA.

Stein, B., (2004), Institute of the Future of the Book, mission statement, http://www.futureofthe-book.org/mission.html (accessed: 10.07.11)

Strizver I., (2006), Type Rules!: The Designer's Guide to Professional Typography, 2nd Edition, John Wiley and Sons, Inc, New York.

Studio 7.5, (2005), Designing for Small Screens, AVA Publishing.

Sutnar, L., (2007), Visual Design in Action, Five Ties Publishing, USA, (original text 1961).

Swan, C., (1969), Techniques of Typography, Lund Humphries, London.

Swan, C., (1991), Language and Typography, Lund Humphries, London.

Swanson, G., (ed.), (2000), Graphic Design and Reading: explorations of an uneasy relationship, Allworth Press, Canada.

Tashman, C. & Edwards, K., (May 2011), Active Reading and Its Discontents: The Situations, Problems and Ideas of Readers, CHI 2011 Proceedings, ACM SIGCHI Conference on Human Factors in Computing Systems. http://www.cc.gatech.edu/pixi/projects/ (accessed 25.11.11)

Tashman, C. & Edwards, K., (May 2011), LiquidText: A Flexible Multitouch Environment to Support Active Reading, CHI 2011 Proceedings, ACM SIGCHI Conference on Human Factors in Computing Systems. http://liquidtext.net/ (accessed 25.11.11)

The Publishers Association, (May 2011), PA Statistics Yearbook 2011, The Publishers Association, London, UK.

Thomas F. & Johnston O., (1981), The Illusion of Life, Hyperion.

Thrift, J. & Roberts, L., (2002), The Designer and the Grid, Rotovision.

Tiddwell, J., (2011), Designing Interfaces, O'Reily Media, 2nd Edition.

Tidwell, J., (2009), Designing Interfaces, O'Reilly Media.

Tinker, M.A., (1963) Legibility of Print, Ames, Iowa State University Press.

Tod, J. N., (February 20, 2012), A wasted opportunity, The Times Literary Supplement, http://www.the-tls.co.uk/tls/public/article875711.ece (accessed 24.05.12)

Tomato, (1999), Bareback: A Tomato Project, Lawrence King Publishing.

Tondreau, B., (2009), Layout Design: 100 Design Principles for Building Grids, Rockport, USA.

Triggs T., (2003), The Typographic Experiment: Radical Innovation in Contemporary Type Design, Thames and Hudson.

Tschichold, J., (1967), Asymmetric Typography, Cooper and Beatty, Toronto, translated by Ruari Mc Lean (original text 1935).

Tschichold, J., (1991), The Form of the Book: Essays on the Morality of Good Design, Lund Humphries.

Tschichold, J., (reprint 1995), The New Typography, University of California Press,(original text 1928).

Tschichold, J., Elemental Typographie, (original text 1925).

Tubaro, A. & I., (1994), Lettering – studies and research on the evolution of writing and print typefaces, Idea Books, Thames and Hudson.

Tufte, E., (1990), Envisioning Information, Graphis Press.

Tufte, E., (1997), Visual Explanations: Images and Quantities, Evidence and Narrative, Graphis Press.

Tufte, E., (2001), The Visual Display of Quantitative Information , Graphis Press.

Tufte, E., (2006), Beautiful Evidence, Graphis Press.

Unger, G.A., (2007), Typography as Vehicle for Science, Faculteit der Kunsten Universiteit Leiden De Buitenkant, Amsterdam.

Van Doesburg, T. (1930), Manifesto of Art Concret.

Van Wagener, A., (March 2005), The Next Big Thing in Online Type, Poynter Online.

Victor, B., (March 2006), Magic Ink – Information Software and the Graphical Interface, Essay http://worrydream.com/#!/MagicInk, (accessed 25.11.11)

Victor, B., (Nov 2011), A Brief Rant on the Future of Interaction Design, Essay, http://worrydream.com/ABriefRantOnTheFutureOfInteractionDesign/ (accessed: 25.11.11)

Vihn K., (Winter 2007), Baby Step, Eye, Vol. 17, 67.

Vineyard J., (2000), Setting up your Shots, Michael Wiese Productions.

Vinh, K., (2010), Ordering Disorder: Grid Principles for Web Design, New Riders Press, USA.

Von Arx, P., (1983), Film Design, P. Haupt.

Walker, J. & Attfield, J., (1990), Design History and the History of Design, Pluto Press.

Walker, S., (2000), Typography and language in everyday life, Pearson Education.

Walter S. & Hanson M., (2004), Motion Blur: Onedotzero - Graphic Moving Imagemakers, Laurence King Publishers.

Walters, J., (2007), Online Drift – a stroll along the highways and strip malls of contemporary cyberspace, Eye, Vol. 16, 64.

Warde B., (1955), The Crystal Goblet: sixteen essays on typography, H. Jacob (ed.), London, Sylvan Press.

Warwicker J., (2007), Nameless Thing, Eye, Vol. 17, 66.

Webster, H. (2001), The Design Diary: Promoting Reflective Practice in the Design Studio, School of Architecture, Oxford Brookes University. http://ebookbrowse.com/websterh-pdf-d109978163 (accessed: 14.06.12)

Webster, H. (2003). Facilitating critically reflective learning: excavating the role of the design tutor in architectural education. Art, Design & Communication In Higher Education, 2(3), 101-111.

Wees W. C., (1992), Light Moving in Time – studies in the visual aesthetics of avant-garde film, University of California Press.

Weingart, W., (2000), My Way to Typography, Lars Müller Publishers, Switzerland.

Wells, P., (1998), Understanding Animation, Routledge, London.

White T. & Small D., (2000) An Interactive Poetic, project at MIT.

White, A., (2005), Thinking in Type: the practical philosophy of typography, Allworth Press, New York.

Wieck, S., (March 2010), Books, Typography and the iPad, blog post, http://blog.samwieck.com/post/457824073/books-typography-and-the-ipad (accessed 28.09.10)

Wiessenmiller, E. M. (1999), A Study of the Readability of On-Screen Text, Unpublished Thesis, Virginia Polytechnic Institute and State University, USA.

Williams, C., (ed.), (1996), Cinema: The Beginnings and the Future, University of Westminster Press.

Willis H, (July 2007), The Amazing Visual Language of Processing, Voice: AIGA online Journal of Design, www.aiga.org/content.cfm/the-amazing-visual-language-of-processing (accessed 15.07.07)

Wilson A., (1993), Design of Books, Chronicle Books.

Wisenbart, R., (February, 2012), The Global eBook Market – Current Conditions and Future Projections, O'Reilly Media, Inc.

Wong, W., (1972), Principles of Two Dimensional Design, John Wiley and Sons, Inc.

Woolman M., (2004), Motion Design: Design for Motion, Sequence and Visual Impact, RotoVision.

Woolman M., (2005), Type in Motion No. 2, Thames and Hudson.

Woolman, M., (1997), A Type Detective Story – Episode One: The Crime Scene, Rotovision SA.

Worthington, M., (Autumn 1999), Entranced by motion, seduced by stillness, Eye Magazine, V9, 33.

Worthington, M., (Autumn 2003), Gertsner's curious compendium is a dense brick of knowledge, Eye Magazine, V13., 49.

Wozencroft, J., (1988), The Graphic Language of Neville Brody: v. 1, Thames and Hudson.

Wozencroft, J., (1994), The Graphic Language of Neville Brody 2: v. 2, Thames and Hudson.

Wurman, S. & Bredford, P., (1996), Information Architects. Graphis Press Corp, Zurich, Switzerland.

Wurman, S., (1989), Information Anxiety. Doubleday Books, New York, 1989.

Wurman, S., (2000), Information Anxiety, Que Publishing, Indianapolis, IN.

Yau, N., (2011), Visualize This: The Flowing Data Guide to Design, Visualization, and Statistics, John Wiley & Sons.

Yee, J (2004), Relearning Typography: Introducing a Cross-Disciplinary Typographic Framework, Futureground: Design Research Society Conference 2004, Melbourne.

Yee, J., (June 2004), A Typographic Dilemma: Reconciling the old with the new using a new cross-disciplinary typographic framework, 2nd International Conference on Typography and Visual Communication: Communication and New Technologies Conference, 2004, Thessaloniki, Greece.

Yee, J., (2003), The Role and Relevance of Typography in Screen-Based Media, Survey, PhD research, Centre for Design Research, Northumbria University.

Yee, J., (2006), Developing a Practice-led Framework to Promote the Practise and Understanding of Typography Across Different Media, (Unpublished PhD Thesis), University of Northumbria, UK.

Yee, J., (Jan 2003), Dynamic Literature Mapping: Typography in Screen-Based Media, European Academy of Design, Conference, 2003, Barcelona.

Zapf, H., (1968), Manuale typographicum: 100 typographical arrangements with considerations about types, typography and the art of printing selected from past and present, printed in eighteen languages, Z-Presse, Frankfurt.

Zwimpfer M., (1994), 2d Visual Perception – Elementary Phenomena of two-dimensional perception. A handbook for artists and designers, Verlag Niggli, Zurich.

Appendix II: *type4screen* website

DVD of *type4screen* website and installation instructions.

Website URL: www.type4screen.com/practice

Appendix III: *Book 2.0* Journal Article

Draft proof of the *Book 2.0* journal article:

Touching the Text of T.S. Eliot's The Waste Land – a critical discussion of interactive design and screen typography for an iPad e-book.

(publication date: December 2012).

Touching the text of T.S. Eliot's *The Waste Land App*
– a critical discussion of interactive design and screen typography for an iPad e-book

By Hilary Kenna

Abstract

Why would a complex, sometimes inaccessible early twentieth century poem become *iPad App of the Week* in the USA? Why would it warrant an editorial in the *New York Times*? Or garner the headline 'The future of digital literature?' on the front of the *Sunday Times Culture Magazine*?

The answer may lie in the interactive experience of the poem that has brought Eliot's words to life for a contemporary audience. Created for the iPad, rich media content, elegant typography and a spare, but deeply functional, user interface combine to form an intimate interactive reading experience that set it apart from other electronic books.

The iPad App of *The Waste Land (TWL App),* was designed by the author in 2011, for its joint publishers –Touch Press and Faber and Faber in the UK. It presents the poem anew, as an interactive multimedia reading experience. The typographic design and presentation of the poem enable the reader to explore the text and its meaning, and to simultaneously listen and watch audio and video performances while reading the text itself. The typography incorporates sound, motion, interactivity and navigation via touch-based interaction with the iPad screen.

The central design vision for the App was to maintain the poem text in its purest form at the heart of the reading experience. The *New York Times* review aptly captures this intent;

> For all its accouterments, The Waste Land App honors the silence of the text itself, the silence that makes Eliot's many voices in this poem so clearly audible.

> *(NYT, June 2011)*

This article will examine how carefully crafted interaction design, typography and rich media content, combine to create a distinctive screen reading experience on the iPad.

It will also demonstrate how a practice methodology for designing screen typography, which was developed during the author's practice-based Ph.D. research, was applied to the design process of the *The Waste Land App*.

1. Background to the Design

Project Definition

The Waste Land App, is jointly published by Touch Press Ltd., and the independent UK book publisher, Faber and Faber, in London. Touch Press Ltd, a UK and US based new media publisher, set up by Dr. Max Whitby and Theodore Gray in 2010, describe their mission 'to create living books that define the future of publishing' (Touch Press, 2012). Prior to TWL App, Touch Press had successfully released two highly acclaimed iPad books: *The Elements (May 2010)* and *The Solar System* (December 2010, also a joint title with Faber and Faber). TWL was their first literary title.

From the outset, there was agreement between the publishers that the target audience for TWL App was not academic, but would be anyone with an interest in poetry, literature and new technologies.

This ensured a clear vision for the design concept and direction of the App:

- to bring the poem to a new audience in a contemporary re-presentation as an multimedia textual experience;
- to use the special capabilities (interactivity and multimedia) of the iPad to give that audience the tools to appreciate one of the greatest works of twentieth century literature.

TWL App was to be an example of a modern digital poetry book on the iPad. It would be sold via Apple's App Store in the 'books' category to a consumer audience. Therefore, all aspects of the App, including its content, visual design, and user interface needed to be clear, engaging, and easy to use.

Application of Ph.D. Research

The author was commissioned to design TWL App for Touch Press because of their requirement for specific expertise in screen typography and user interface design.

For the author, designing TWL App presented the opportunity for a case study in which to apply a practice methodology for designing screen typography that was being developed as a major practical outcome of the author's practice-based Ph.D. research.

The methodology was conceived and devised based on research findings from three core areas:

- a critical review of contemporary practice in screen typography;
- a literature review of the field of typography, and;
- an in-depth analysis of the Swiss typographer Emil Ruder's seminal book *Typographie: A Manual for Design* (1967).

The findings from the review of contemporary practice and literature led to the identification of a set of properties for screen typography, which are distinctive from traditional printed typography. They include: 3D space, sound, motion, timing/temporality and interactivity.

The literature review led to the focus on the work and teachings of renowned Swiss typographer and designer Emil Ruder (1914-1970). Ruder's distinctive approach to typography is underpinned by conceptual design principles that are independent of any specific technology or technique, and therefore remain relevant to contemporary practice of typography in any media.

Upon examining Ruder's work, design principles such as: contrast, form and counterform, shades of grey, rhythm and kinetics; were adapted and extended to design practice for screen typography.

These were further incorporated into the resultant practical methodology, illustrated in the diagram below (figure 1). The developed methodology progressed into the form of an

experimental *Practice Matrix* that combines; a typographic element, with a typographic property, and a design principle.
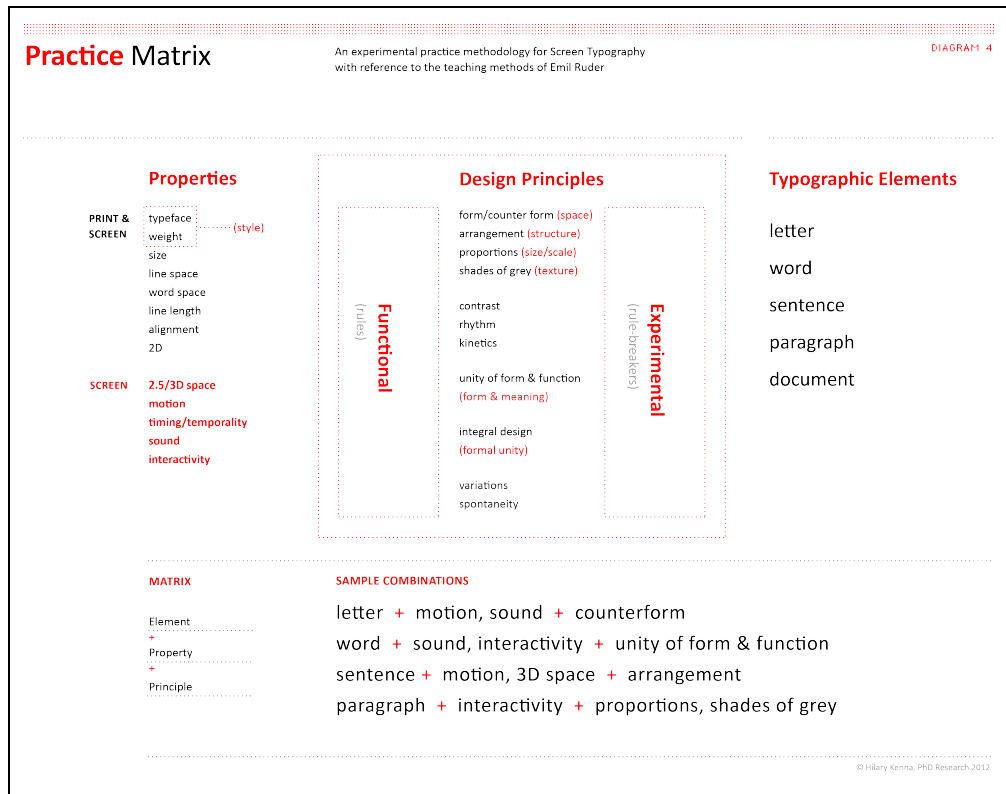
Figure 1. *Diagram of Practice Methodology for Screen Typography developed by Hilary Kenna, 2012.*

Together, they form the constituent parts in the practice of typographic design. A chosen combination of three or more parts (figure 1: Sample Combinations) can be used as the basis to create practical exercises in screen typography. Equally, the Practice Matrix can be applied to during the design process of a commercial project, just as it was in TWL App.

Design principles in the matrix can be applied either as set of functional rules for governing best practice, or as a set of creative axes against which to break the rules, and to engage in experimental practice.

In the course of developing the methodology, the author used the matrix to conduct a series of experimental samples based on constituent typographic elements such as letter, word and sentence. The design of TWL App presented the first opportunity to apply the matrix to a complete text that would be read on screen (and also to the context of real design project).

This discussion will explore the application of the methodology to the resultant design of TWL screen reading experience, and review its impact in the context of contemporary e-books design.

The Waste Land App – Design Brief
Before a critical discussion about the design of TWL App, it is useful to situate it within the current debate surrounding the future of the book, and to establish a definition of what constitutes an e-book.

Having reviewed the literature, and taking into account the continually changing nature of technologies relating to e-books, the following definition appears to capture its current evolution and many technological guises:

> *An electronic book (also e-book, e-book, digital book) is a text- and image-based publication in digital form produced on, published by, and readable on computers or other digital devices.*
>
> (Suarez & Woudhuysen, 2010: 19)

Certainly, TWL App fits with this definition – it is a multimedia text (encompassing images, text and sound) that was produced digitally, has been published digitally via Apple's App store and is read on a digital device, the iPad.

The design issues for TWL App reflect the same concerns evident in much contemporary writing and research on the future of book design and publishing which can be found online – in blogs, journals, magazines and amongst the plethora of conference material[1].

A review of this online literature suggests three recurrent themes evident for the design and development of e-books, as follows:

1. **Rich Media Content** (Kelly 2000, Bridle 2011) – how to integrate different media forms (video, audio) with the main text narrative without breaking the reader's flow and engagement with the narrative..

2. **Surface Presentation** (Dobbs, 2010, Mod 2011)– the visual form of the text on screen, how the information is arranged and represented so readers can read it, find their way through it, and use it.

3. **Digital Innovation** (Mod 2011, Carmody 2012) – the inclusion of new or extra digital features or functionality that distinguishes the e-book different from its printed counterpart.

From the author's perspective, screen typography plays an integral role in each of these aspects and they also map directly to the core tasks that emerged in the design brief for TWL App, as follows:

- *Typography and multimedia* – how to maintain the poem text as the focal point of the reading experience with the addition of rich media content?

- *Typography on the screen (digital page)* – how to create a typographic treatment on screen reading experience akin to a paper book, addressing design issues such as composition, layout, hierarchy and legibility on screen?

- *Typography and interactivity* – how to enable readers to navigate and interact with the text, as well as ensuring enhancements that would flow from the digital reading experience?

2. Rich Media Content

Rich Media Content

Until the last decade or so, reading text on a screen has, seemed at odds with a medium which we traditionally associate with moving images and sound. However with the advent of e-book reader devices and tablets such as the iPad, coupled with the volume of information and the ubiquity of screens in our daily lives, we have become accustomed to reading, writing and editing text on screens. It now seems apparent that the screen will be the medium of choice for the future of both reading and publishing books (Wischenbart 2012, IDPF, 2010 and PA, 2011).

---

[1] *The Future of the Book Conference* (Florida State Universities), *Books and Publishing* (Common Ground), *Tools of Change for Publishing* (O'Reilly), *The Book Sellers Future e-Book Conference* (The Book Seller Group).

Kevin Kelly, author and founding editor of Wired is a key commentator on the changing nature of books and text in a digital context. According to Kelly, the digital age has caused a major societal shift from a culture of books and literacy, to a culture of screens and visuality.

Kelly believes that digital culture has altered our traditional perception of text to encompass a richer form of media content, where image, sound, video, and text intertwine. Consequentially, this rich media content also demands a new type of reading. Kelly considers that as media content and delivery platforms continue to merge – 'we may have books that we watch, and television that we read' – the culture of the book and the culture of the screen will be on the same digital page (Kelly 2008).

Kelly's argument brings into sharp focus the core problem of designing multimedia texts –

– What are they – if they encompass words, sounds, images, or movies?
– How can they be read – if the words can speak, and move, and react to the click of a mouse or the touch of a finger?

Rich Media Content in TWL

The inclusion of rich media content was central to the aim of TWL App, in bringing the poem to a broad contemporary audience. However, careful consideration with regard to how rich content – sound, image and video – could be integrated with the textual reading experience was a cornerstone in defining the design approach. At no stage during the development of TWL App was it considered to use rich media to illustrate the text.

The Waste Land poem, originally published in 1922, is a long complex modernist poem (432 lines). It has been called 'one of the most important poems of the 20th century' (Bennett, 2009). The poem shifts between satire and prophecy, and has abrupt and unannounced changes of speaker, location and time, as well as containing references to a vast and dissonant range of cultures and literatures. The poem has been the subject of much debate and study in academic literature and is a pre-requisite on most third level literary curriculums. Like Ulysses, it has a reputation for being somewhat inaccessible to mainstream readers outside of the scholarly community. Faber and Faber in partnership with Touch Press set out to breakdown those barriers.

In TWL, the most difficult design challenge was how to present the primary text of the poem on screen to create an intimate reading experience that could rival print. At the same time, the screen reading experience had to offer a set of extended features that would distinguish it from that of a printed book.

From the publisher's standpoint, the major concern was how to sustain the reader's engagement within the core text narrative, especially when other rich media forms such as sound and video would be competing for their attention. Ultimately, they wanted to ensure that readers to read the Eliot's words. The question of how sound and video could be integrated with text so as not to break the reader's flow from the core narrative was critical to this endeavour.

From a design perspective, the typographic design was not only concerned with style and composition but also how to incorporate sound, motion and interactivity into the representation of the text. As set out earlier by Kelly, creating a successful on-screen reading experience is dependent upon the reader understanding what sort of engagement (reading, watching, listening, scrolling, tapping) is required from them. The user interface design, typographic presentation and composition are the means through which this is communicated to the reader.

In TWL, the way in which the rich media content was selected, edited and presented to the reader tries to address this challenge. As a result, the poem text always occupies a central position on screen, and is the main focus of the reading experience. To this end the rich media content; which includes extended text annotations, audio readings, a video performance of the poem, and over thirty critical video commentaries; is positioned for the most part in a secondary location, in a

small section, at the side or top, of the screen. In contrast, the poem text maintains a central position on the screen throughout the App.

The audio and video material in TWL App was created with the highest production values and crafted carefully into layers around the core poem text. The list of annotated screen shots below (figures 2-7) show how this media enhances the reading experience of the poem.
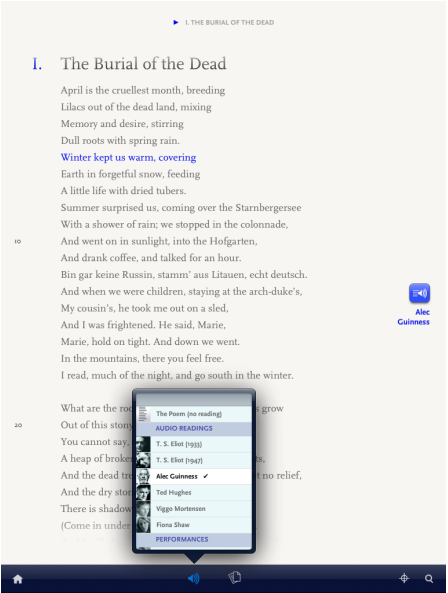
Figure 2. *Popover menu showing six synchronised readings and one video performance of the poem by, among others, T S Eliot himself, Sir Alec Guinness and Viggo Mortensen.*
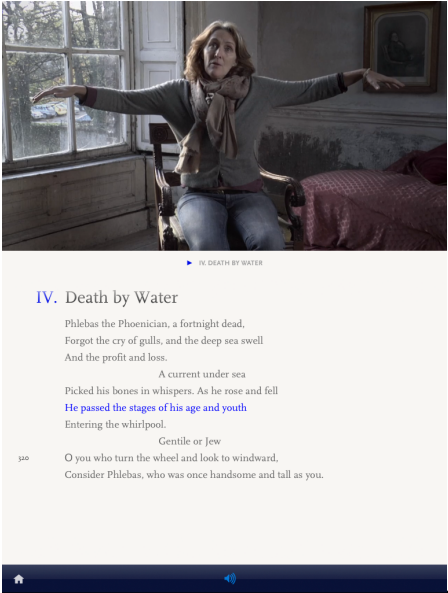
Figure 3. *Video performance of the poem by actress Fiona Shaw*
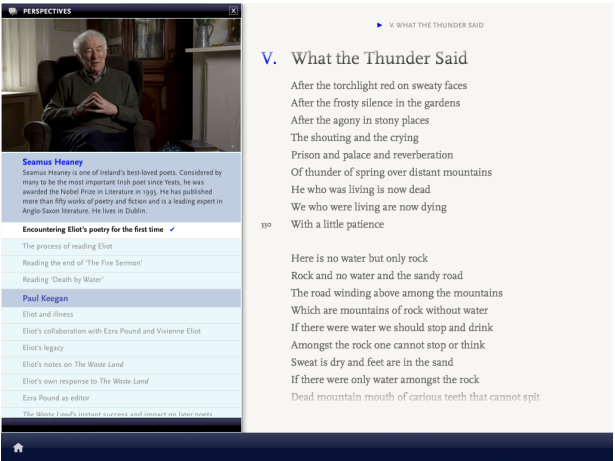
Figure 4. *35 expert perspectives on different aspects of the poem in the form of filmed interviews with Seamus Heaney, Jeanette Winterson and others.*
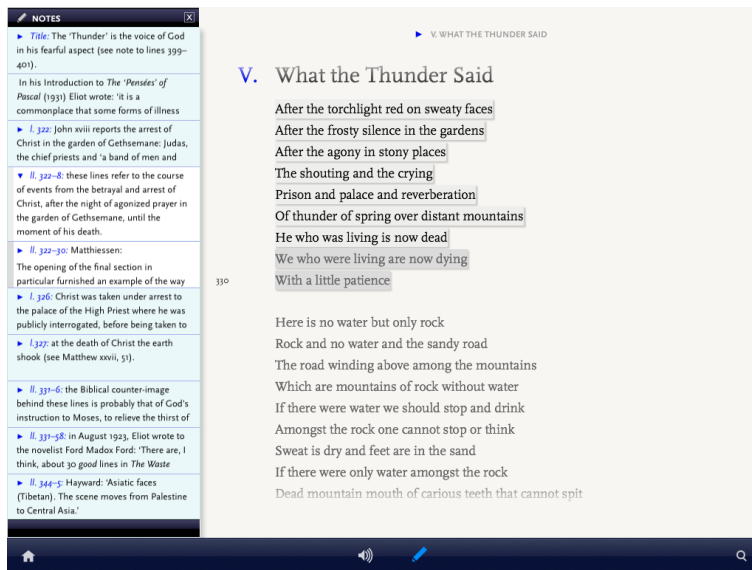
Figure 5. *Extensive and detailed notes attached to every line (and word where applicable) of the poem, which can be accessed to explain the many references and historic allusions within the poem.*

Figure 7. *Pinch and zoomed view of manuscript.*

Figure 6. *High-resolution images of Eliot's original manuscript, including Ezra Pound's extensive edits and deletions, showing how the poem took shape.*

The next section explains the design of interface elements and typographic presentation, which enable the reader to easily access the rich media features in TWL as a seamless part of the reading experience. It will also demonstrate how the practice methodology, devised during the author's Ph.D. research was used to address this aspect of the design brief for TWL.

Typography, Sound and Video

Returning to the Ph.D. practice methodology *Practice Matrix*, sound was identified as one if the screen typographic property not available in print. In TWL, sound plays a key part in creating a media rich reading experience of the text, through a core set of audio performances by different

actors and by Eliot himself reading the poem. There is also a specially commissioned video performance of the actress Fiona Shaw performing the poem.

Design principles relating to sound and typography – such as rhythm, contrast and unity of form and function – developed for the Practice Matrix methodology were particularly relevant to TWL.

The design problem was how to connect the audio and video to the typography while keeping the reader focused on the text itself. From the Practice Matrix, the following combinations were used as a prompt to try out different design treatments:

word, sentence + sound + rhythm, variations, contrast

word, sentence + sound + rhythm, unity of form & function

The first task was to design a typographic treatment for highlighting a word or line of text to show its synchronisation with the voice reading the poem, and to keep the reader's attention on the words as they were being read. The images below show different styles of typographic emphasis to highlight the text (figure 8).
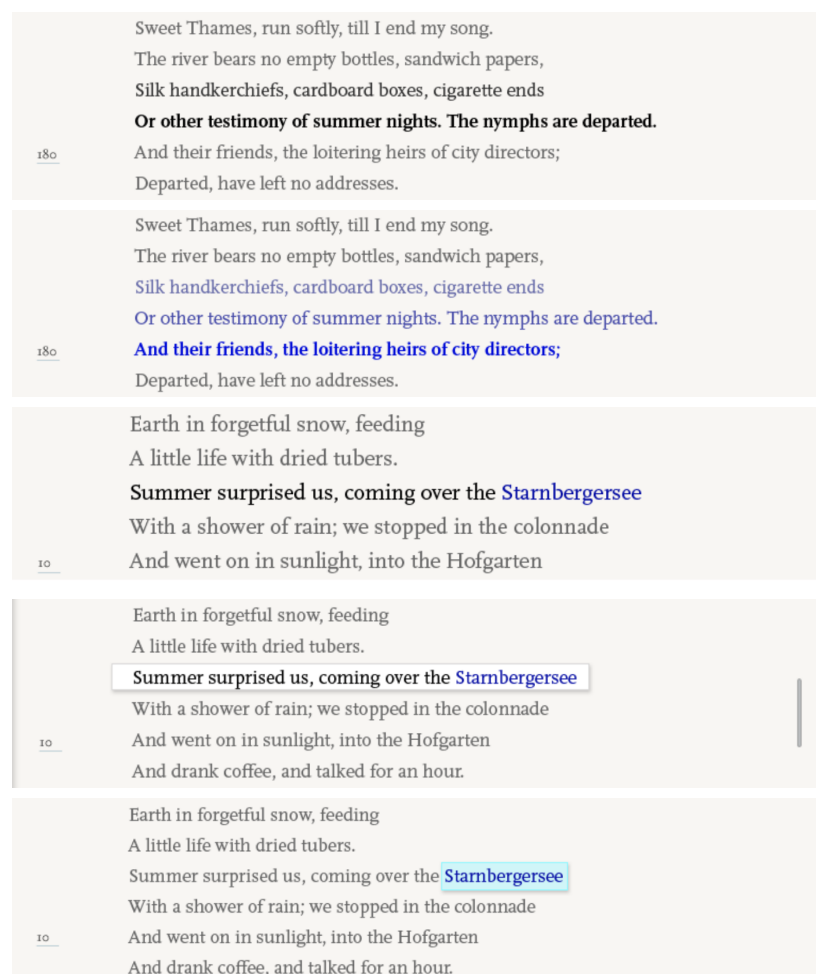
Figure 8. Typographic highlighting to show audio and text synchronisation as the poem is being read.

The blue text highlight in the second example was chosen. The concept behind its realisation, was that the colour would pulse over each line as it was spoken. Thus, the blue highlight would sweep through the text, line by line, in rhythm with the intonations of the readers voice. The line highlight was supposed to gradually fade up and fade down, from one line to another, rather than

switch colour abruptly, which would lack the fluid movement echoed in the flow of the reader's voice. This fade transition was programmed to match the design specification.

The other aspect of implementing the highlight related to motion. Even though the line highlight acted as a visual indicator to show the reader's voice as it progressed through the text, the need to also move the text to demonstrate this progression was suggested by Theodore Gray from Touch Press. The result is that the poem text auto scrolls as the voice reads the poem and the line highlight remains hovering about one third down from the top of the screen (figure 9). This creates a comfortable reading experience in synch with the audio recording, because the reader's eyes are positioned around the optimum focal point on the screen, which comes from design principles governing the grammar of film known as the 'rule of thirds'. These principles were identified and mapped to the 2D composition property of screen typography in the Practice Matrix.

From an interactive perspective, the text and sound are also intertwined. If the reader touches a line of the poem while the poem is being read, the audio jumps to speak that line of the poem and continue the reading performance from that point. The effect is – touching any line of the poem in the *Readings* section will be read aloud. The words speak in response to the reader's touch.

The other interactive problem was how to enable the reader to easily switch between different voices reading the poem. This facility is presented via a popover menu that is invoked when the reader touches the speaker icon on the navigation bar at the bottom of the screen (figure 9). When the reader chooses a different voice, the audio will switch and continue on from the previous voice. Effectively, the reader can switch to a different voice midway through the poem as often as they wish. An icon with the current voice is shown on the right of the screen and can be tapped to turn on/off the audio.
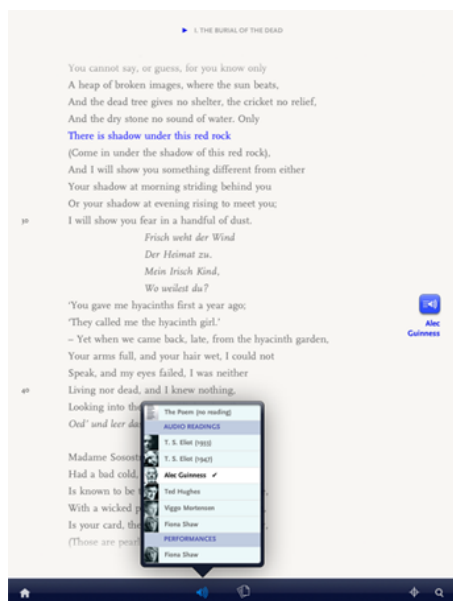
Figure 9. Line highlight, readings popover-menu and current reading button in *Readings* section of the poem.
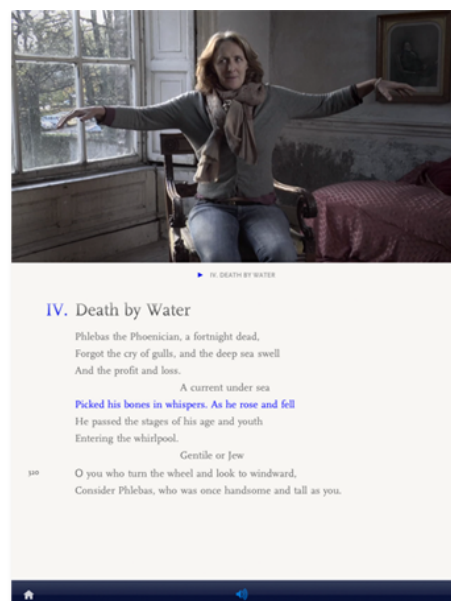
Figure 10. Line highlight in synch with video performance by Fiona Shaw, in *Performance* section of the poem.

The same intent, with regard to integrating the video performance with the text of the poem, was applied in the *Performance* section as it was in the *Readings* section. However, it is more difficult to attract the reader's eyes towards text when there is a moving image sequence to look at. The aim of keeping the poem text on screen, and in sync, with the video performance playing remained paramount. To this end, one of the most innovative features of TWL App was implemented by John

Cromie, Chief Technical Officer at Touch Press. Each line of the poem highlights in the same way as it does in the *Readings* section in synch with the actress Fiona Shaw as she performs the poem. So, even if the reader is watching the video, they are aware of the colour highlight and auto scrolling text in their periphery vision as the performance progresses (figure 10). In a similar manner, if the reader taps on any line of the poem, the video will jump to show Fiona Shaw performing that line and continue from that point. However, the interactive relationship between the video and text works in both directions. If the reader swipes their finger over the video image from left to right, they can fast forward the video performance and the poem text will automatically highlight and auto scroll to that line of the poem. Equally, if the reader swipes their finger from right to left, they will rewind the video and the poem text will highlight and auto scroll back to that line of the poem. The net effect is the seamless interactive integration of text, sound and moving image. The reader's interaction with the text can drive the moving image or their interaction with the moving image can drive the text.

In this way, the reader's attention is focused on the performance of the poem as being an integral part of a rich media text. They can choose to watch and read and view parts of the sequence over again, switching from reading to watching and watching to reading in order to gain a deeper understanding of the text. The seamless interchange between reading and watching, is further facilitated by a simple turn, left or right, to change the orientation of the iPad, from portrait to landscape mode. Turning the iPad to landscape mode causes the video performance to play full screen making the poem text disappear. Turning the iPad back again to portrait mode will reduce the video performance, which continues playing, without pause or interruption, to its previous position, occupying a third of the screen above the text complete with line highlighting and auto scrolling in tact.

3. Surface Presentation

Surface Presentation

The contemporary debate about the future nature of book content naturally flows into a discussion of how to design the presentation of that content. Again, it is worth highlighting critical opinion on the subject in order to contextualise the scope and limitation of TWL's surface presentation.

One of emergent voices on digital book design, is writer and designer of Flipboard[2] for the iPad, Craig Mod, who believes a key design challenge is reconciling our notion of older paper books with a more generalized view of content, as the two merge together in digital form. Mod suggests that from a user-interface and design perspective, e-books are becoming more about the design of 'content containers' that can facilitate changing or 'mutable' content, and less about the surface display because of rapid technological improvements that address issues of resolution and legibility (Mod, 2011).

Another influential author is Ethan Marcotte, who writes for the online magazine *A List Apart*. He conceived the term 'Responsive design' which has had a major influence on the evolution of contemporary discussion about the design of digital content. Marcotte's concept for responsive design is based on designing a set of frameworks, or fluid grid containers, that adapt to both the changing nature of the real-time digital content flowing through them, and to the different types of digital device they are viewed on. HTML and CSS techniques are used to deliver consistency in the design presentation of the screen reading experience on any display irrespective of size. This

---

[2] Flipboard is a social magazine application that collects the content of social networks and other websites, designed specifically for the iPad's touch screen and allows users to "flip" through their social networking feeds and feeds from websites that have partnered with Flipboard.

approach is fundamentally different to traditional design processes, where designers can control every aspect of the layout and typography on paper.

Surface design presentation on e-books is not just dividing up the surface of the screen with a grid in which to organise content. Its other major design focus is concerned with how to structure and access multiple pages of text within a single screen. As e-books don't have the physical interface conventions of a paper volume (physical mass, spine dividing it, pages to turn, flick through etc.), the surface presentation of the digital interface has to encompass physical, structural and navigational functions.

Kevin Kelly's critical commentary on the surface design of e-books is worthy of inclusion here. He suggests that traditional conventions of literacy should be 're-presented' in digital books, because they are too innovative to discard. Having been developed over centuries, they have been learnt and understood by readers from an early age (Kelly 2000). Unfortunately, from the inception of e-book design, there have been some poor examples of transposing traditional methods of interaction and design onto new media. Paper and page-based metaphors have often taken the form of badly realised textured backgrounds and jerky page turning animations. Kelly remains optimistic that page technology is 'too handy and too evolved' to be replaced and that page turning is a 'hard to improve navigation system' (Kelly 2000).

The iPad, and other touch-based digital devices are described by Bret Victor, a former Human Interface Inventor at Apple, as 'pictures under glass' and as representing a vision of interactive design that is 'not visionary' (Victor, 2011). For Victor, the iPad is not just a surface display for interacting with digital content, but a superficial display that provides a very limited interactive experience of the content it presents. Victor's issue with the iPad and its ilk, stems from his belief that the interactive surface presentation is far removed from the tangible experience of holding a book in one's hands. On the iPad, accessing and interacting with content is limited to a set of one or two finger gestures on its shiny surface. According to Victor, this falls far short of taking not into account the refined capability of human hands 'to feel and manipulate things' in many different nuance ways.

In consideration of the context for designing the surface presentation of e-books as outlined by the likes of Mod, Marcotte, Kelly and Victor, it can be fairly acknowledged that the design of TWL occurs in a limited environment. TWL is designed for specifically for the iPad platform, a touch tablet where interaction with the content is via the screen surface using a small set of finger touch gestures. The content of TWL does not contain real-time or changeable content (excepting changing text size), and does not therefore employ tactics of responsive design. Its surface presentation does not reference the traditional book metaphor in a visually explicit way although it does utilise organisational conventions such as running headers and chapter like sections. Perhaps, the strength of design in the surface presentation of TWL App appears to be in the spare interface that remains subservient to the primary book content but at the same time is easy to use and provides a rich set of extra functions not found in paper based books.

What follows is a detailed discussion of the process of designing TWL's interface.

Typeface Selection for TWL

Selection of an appropriate typeface to set the poem text on the iPad screen was the first major design task relating to the surface presentation of TWL. Faber wanted something modern, different to their traditional presentation, where Sabon is used as one of their classic poetry typefaces, also with Caslon as the colophon, and Janson occasionally. They remained cautious about veering too far from tradition.

From the outset, the Practice Matrix aided the selection through the creation and comparative sample settings in different typefaces. Several factors were taken into consideration during the selection of a shortlist of potential typefaces:

- the characteristics of a maximally legible typeface on screen (as identified in the author's Ph.D.) – low contrast strokes, strong serifs and joins, horizontal curves, round open counters etc;

- a typeface that was not already overly-used on screen, such as the web-safe fonts: Georgia and Verdana; or one of the Microsoft Vista C fonts (Cambria, Calibri, Consolas, Corbel, Constantia), which are now associated with Microsoft software products;

- a typeface family that included a range of weights which would allow for a greater range of contrast within the typographic design;

- a typeface family that included both serif and sans serif fonts in order to facilitate the range of different text applications within TWL App such as: poem text, commentary, notes, annotations, user-interface text;

- a typeface with some distinctive design features;

- the use of the Practice Matrix to make typographic samples demonstrating typeface design characteristics as well as, size, weight, line-length and spacing.

The choice for experimentation was narrowed to five potential typefaces that included: two contemporary slab-serifs, two contemporary serif typefaces and two sans-serif typefaces.

The contemporary slab serifs, Museo and Archer, were chosen primarily for their legibility at small sizes and for their quirky appealing character. Both also had a large range of different weights in normal and italic, which would offer flexibility for contrast and texture when applied to the typographic design of TWL. Museo also included a full sans-serif set with five weights.

The Waste Land
Museo Slab 100 (light), 100px

The Waste Land
Museo Slab 300 (regular), 100px

The Waste Land
Museo Slab 500 (semi-bold), 100px

The Waste Land
Museo Slab 700 (bold), 100px

The Waste Land
Museo Slab 900 (black), 100px

The Waste Land
Archer light, 100px

The Waste Land
Archer regular, 100px

The Waste Land
Archer medium, 100px

The Waste Land
Archer semi-bold, 100px

The Waste Land
Archer bold, 100px

Figure 11. *Museo Slab* (2008) designed by Jos Buivenga, Exljbris.

Figure 12. *Archer* (2008) designed by Hoefler and Frere-Jones.

The chosen serif typefaces were Scala Pro and Celeste. Both are contemporary and modern in design but remain classic looking when applied in design.

The Waste Land
Scala Pro regular, 100px

The Waste Land
Scala Pro bold, 100px

The Waste Land
Scala Sans Pro light, 100px

The Waste Land
Scala Sans Pro regular, 100px

The Waste Land
Scala Sans Pro bold, 100px

The Waste Land
Scala Sans Pro black, 100px

The Waste Land
Celeste regular, 100px

The Waste Land
Celeste bold, 100px

The Waste Land
Celeste extra-bold, 100px

The Waste Land
Celesete black, 100px

The Waste Land
Celesete sans regular, 100px

Figure 13. *Scala Pro and Scala Sans Pro* (1990) designed by Martin Majoor, Font Shop.

Figure 14. *Celeste* (1995) designed by Christopher Burke, Font Shop.

Scala's uppercase 'W' stood out as having a uniquely memorable form when compared with the other typefaces. It was the favoured typeface of the researcher, because of its modern but classic design appeal and good legibility on screen. It also met all of the criteria considered for selection.

In addition to several other tests (see figures 15-18), a small section of the poem text was typeset in each typeface at the same size, for comparison of:

• general look and feel in terms of readability;

• and to assess the 'colour' or blackness of the text.

The Practice Matrix formula of '**sentence + typeface + proportions, shades of grey, contrast**' was used as the guiding principles behind these tests.

The different settings, using sample pieces of text from the poem were typeset as Photoshop pngs, HTML/CSS and then exported for viewing on the iPad screen.
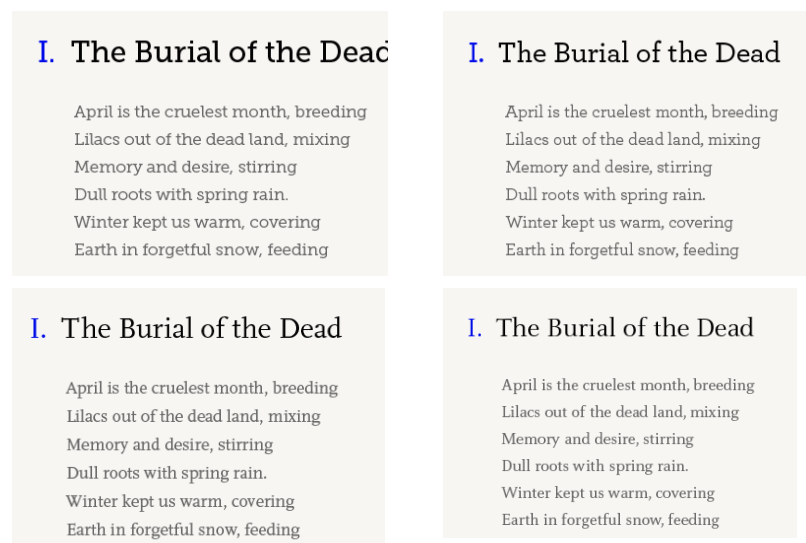
Figure 12. Comparison of typesetting of Museo Slab, Archer, Scala and Celeste.

Several sentences were typeset in the same size using proportional relationships based on the Fibonacci sequence. The contrast between the background and text were based on testing 'shades of grey' to determine a legible tonal difference that was comfortable on the eye.

At this point, the typefaces were presented for discussion with Faber and Touch Press, to assess their appropriateness for the presentation of TWL on screen to a modern audience.

The samples settings were presented to the team and critiqued for their pros and cons. The advice and approval of Faber's design department were also solicited. They too favoured Scala, for the design of TWL, but wanted to see it compared with other serif typefaces traditionally use by Faber, such as Sabon and Janson.

Figure 13. Comparison of typesetting of Sabon and Janson.

Museo and Archer were dismissed as being too far from Faber's traditional classic style of presentation. Museo was also deemed too heavy or 'black' in colour. Neither typeface was considered to have the elegance required for presenting poetry. Celeste was positively received but not distinctive enough when compared with Scala. Neither Sabon nor Janson were thought to be modern and their legibility was compromised at small sizes because of finer serifs and contrasting strokes.

Scala was selected as the most distinctive choice to capture the requirements by Faber and Touch Press, for a contemporary classic typeface that looked beautiful but was equally legible on the iPad screen. Scala created the right tone, through its look and feel, being both aesthetically pleasing and easy to read.

n n

handgloves handgloves

Figure 14. Close up of Scala sans and Scala (serif) letterforms.

Scala has good legibility on screen primarily because of its straight serifs and low contrast strokes. It encompasses both sans and serif typefaces with a range of weights that facilitate texture and contrast in the typography. Scala was also a suitable choice to cover all of the textual applications within TWL.

OLV ● ▮ ▼
AVMWZ
mnur mnur
ocgdps

OLV ● ▮ ▼
AVMWZ
mnur mnur
ocgdps

Figure 15. *Scala Pro and Scala Sans* examination of letterform shape and design.

The serif typeface was used for the poem text and the sans serif typeface was used for annotations and user interface text.

Typographic Measure and Colour

The next application of the **Practice Matrix** was to determine an appropriate typographic 'measure' for the design of TWL. This normally encompasses the relationship between the type size, the length of a line of text, and the amount of spacing between each line of text. The combination of these measures, provide the basic proportions upon which the typographic grid for the entire text can be derived. It also demonstrates the 'colour' or texture of the typeface when applied to the design of the text.

The following formulae were used as a guiding base from which to create a range of typesetting examples to establish the typographic measure that would determine the overall 'colour' (shade of grey) of the text:

'paragraph + size + arrangement, proportions';

'paragraph + size + proportions, shades of grey'.
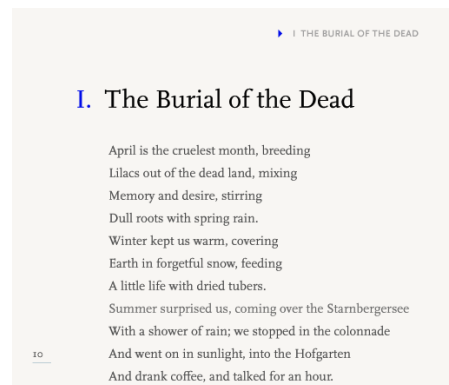
Figure 16. text size 15px / 26px line spacing
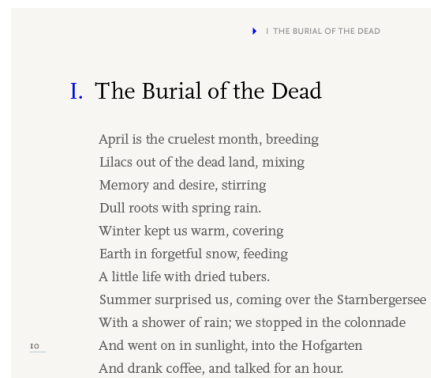
Figure 17. text size 18px / 29px line spacing

A key feature of e-books, and online text, is the facility for readers to increase the size of the font. In TWL it was initially planned that readers would be able to increase the text size with the 'pinch and zoom' gesture, now synonymous with the iPhone and iPad. However, very quickly, the problem with this as a potential solution became apparent. As in most poetry, and especially in the case of TWL, line breaks have to be preserved in keeping with the original form of the text of the poem written by the poet. With free 'pinch and zooming', the text would reflow at larger sizes and the line breaks would be disrupted. This resulted in a reducing the scalability of the text to a small number of fixed sizes that the user could choose from. Several samples of typesetting were tested to ascertain optimum legibility at different sizes that would fit a maximum line length across the width of the iPad screen in both portrait and landscape orientation.
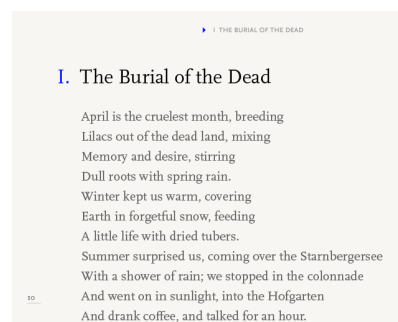
Figure 18. text size 21px / 32px line spacing
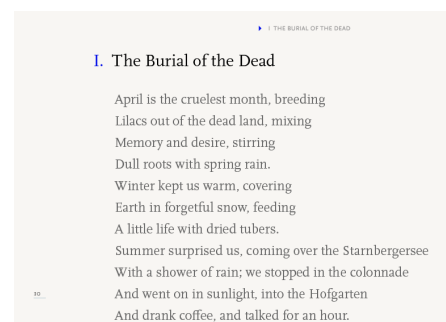
Figure 19. text size 24px / 38px line spacing

In the final product, only two text sizes, 18px and 24px, were implemented due to time constraints. These are accessed via 'settings' at the bottom of the main content page of TWL.

Grid

A grid was developed from the text measure samples in conjunction with the format of the iPad screen dimensions for both orientations. The grid had to work with the portrait format (768px wide x 1024px high) and the landscape format (1024px wide x 768px high) of the iPad. Different numbers of columns and column widths were tested to create overlay panels that would contain

video content and the annotated text notes. The following images (figures 20-25) illustrate the final grid that was developed and its application across a range of content and screen orientation.
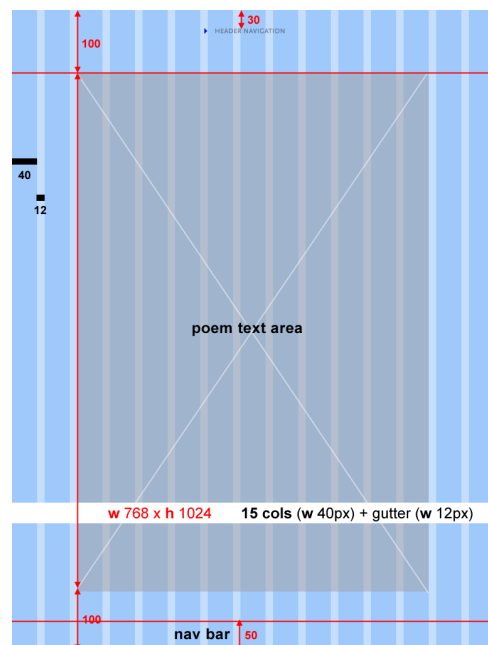
Figure 20. *Portrait grid: 768px x 1024px with 15 columns of 40px width with 12px gutter*
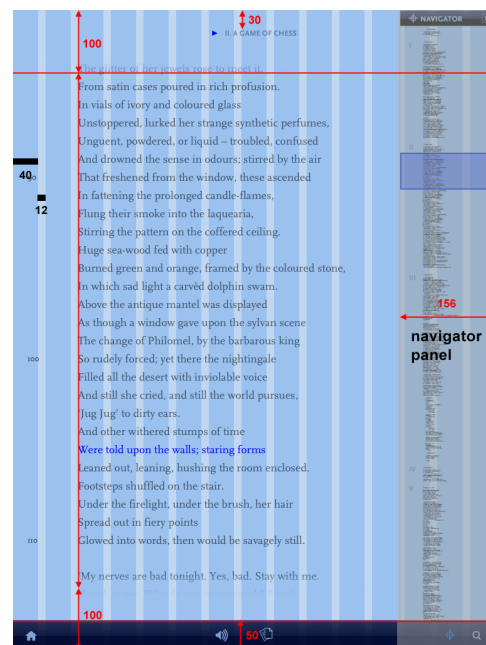
Figure 21. *Portrait grid overlaid on Poem text with Navigator panel visible.*

A key consideration in designing the side panel overlays was to ensure that they did not obscure the relevant poem text. Grey panels of different widths (spanning different numbers of columns) were overlaid on both left and right sides of the screen to see the impact on the poem text block (see figures 21, 22 and 24).

The extra screen width in landscape orientation offered an ideal way to facilitate these overlays while still leaving enough room to move the main text further to the right (see figures 21 to 24). This was a key factor in determining why both the Notes and Perspectives sections are invoked when the reader turns the iPad on its side to landscape orientation. The wider screen format of the landscape orientation meant the poem text could maintain its typesetting (size) and the side panel could be seen alongside without obscuring the text.

The feature became popular during testing as a very easy way to invoke extra content and functionality while maintain the primary poem text on screen at the same time.
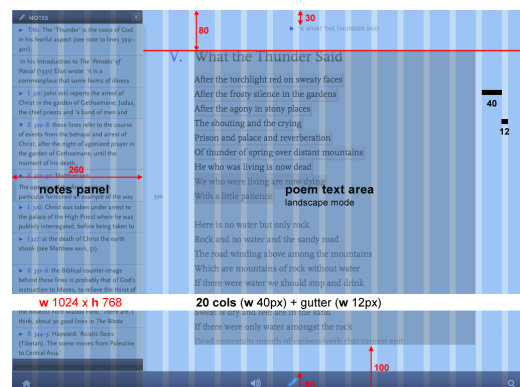
Figure 22. *Landscape grid: 1024px x 768px with 20 columns of 40px width with 12px gutter. Landscape grid overlaid on Poem Notes. Annotated Notes appear in the left panel.*
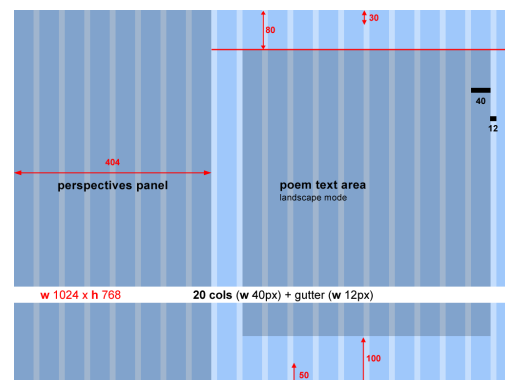
Figure 23. *Landscape grid: with Perspectives panel overlay on left measuring 404px wide.*
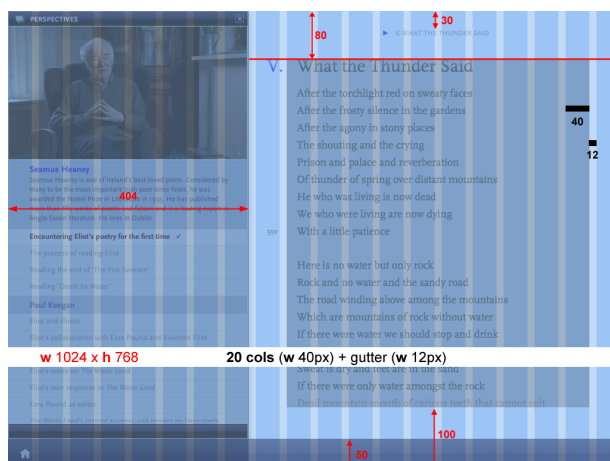
Figure 24. *Landscape grid overlaid on Perspectives section. Perspectives videos, contributor biographical information and the list of contributors appear in the left panel.*

Colour

The typographic colour palette of TWL user interface was carefully considered for both is readability and legibility.

The poem text is not presented on white, but on a warm tone of light grey, and the text and background are not so contrasting as to tire the reader's eyes. The idea behind the colour choice was not to emulate paper stock, but rather to reduce the cold harsh quality of light that is sometimes created from a backlit LCD screen such as the iPad, particularly in the case of a sustained reading experience that TWL would necessitate. The muted warm grey palette was intended to create a softer, quiet typographic presentation that would not draw attention to itself, leaving the reader to focus on the already demanding nature of Eliot's text.
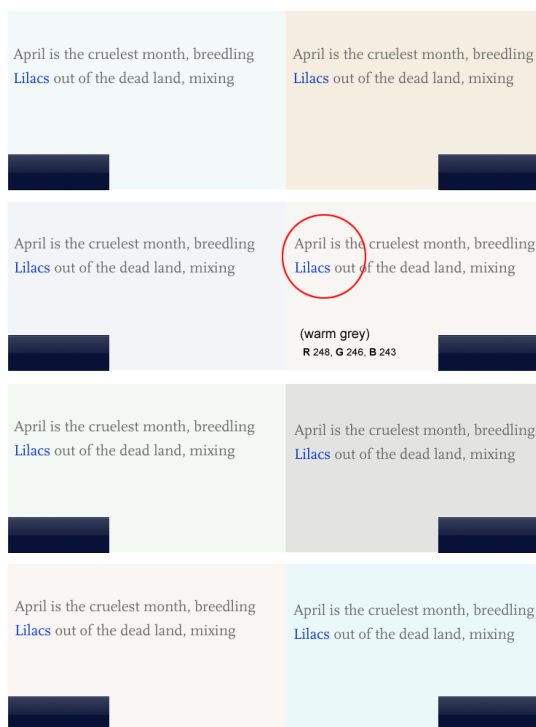
Figure 25. Testing tone and contrast of different background colours and text.

The general aim of the colour choices used in TWL was to keep interface elements and overlays muted and spare so as not to distract the reader from the main poem text. At the same time, the interface elements had to be clearly recognisable as different from the main content, but still be easy to understand and to use from an interactive perspective.

The colour palette was also developed by applying design principles from the Practice Matrix; 'shades of grey' and 'contrast' to the creation of a number of practical colour tests (figure 25).

Emil Ruder's principles about the use of colour were coupled with those of Edward Tufte (information design expert and author). Both advocate the use of small amounts of intense colour in contrast with a neutral range to create focal points (Ruder 1967, Tufte 1996). The use of bright intense blues, were used as highlight colours within the text and as interface elements. These small sparks of colour, which stand out easily against the generally muted TWL palette easily guide the readers' eye to something of note or to something that is interactive (touchable).
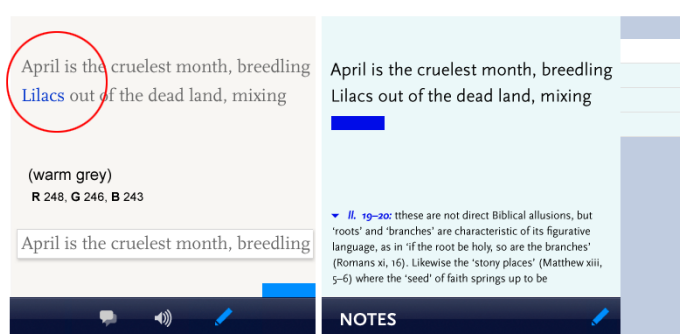
Figure 26. Development of colour palette for typographic and graphic elements.

The main navigation bar and other interface panels were framed in dark blue with contrasting (reversed out) white typographic labels. Text other than the main poem narrative, such as interface text and annotations were presented on overlay panels of pale blue and set in Scala Sans. This created contrast and legibility between different parts of the App.

4. Digital Innovation

Interactive Design and Typography

Having established the surface presentation of TWL through its main typographic style and treatment, the remaining aspect to be determined was the interactive design and user interface representation of the App.

In almost all, contemporary critical discussion of the future of the book, is the expectation of innovation that digital technology promises – either to the form of the book, or to the form of reading experience. In the broad field of eBook design, TWL's innovations are perhaps small scale, but relative to the range of contemporary exemplars in digital literature, they make a worthy design contribution.

Interactive design is often described as the 'look and feel' of the content or information – how it is visually presented to the audience and what is the experience they feel when interacting with it.

In the context of TWL, the interactive design comprised of:

- **stylistic behavior** of the text in response to the readers touch;

- **navigation controls** – icons, panels and other mechanisms that would enable the reader to navigate the poem text;
- **media controls** – that would enable the reader to interact with other forms of media represented in or attached to the poem text.

Navigation

The Practice Matrix was used as a starting point to guide the interactive design of TWL, starting with navigation, by focusing on the following combinations of elements, properties and principles:

- **document + interactivity + arrangement (hierarchy)**
- **document + interactivity, motion + arrangement (hierarchy), kinetics**

The first formula concerns functional issues pertaining to the hierarchical structure of navigation – how would the reader move through the different sections of the poem and understand where they were at all times. The second formula emphasises the expressive qualities of motion within the typography and graphic elements, through the careful design of how they would move and what rhythmical interaction this would create as a whole.

The typographic structure and framework that exist for printed books include a number of well-known conventions that have been developed over centuries of print literacy. Kevin Kelly, author and digital media critic, calls these the user interface conventions of book literacy and adds a few screen conventions that have recently emerged from the prevalent use of online media (Kelly 2008). The list includes: table of contents, page numbers, alphabetic, header/footer, footnotes, bibliographic citations, quotation symbols, hyperlinks and tags.

Kelly suggests these 'literary innovations' are still relevant and useful on screen and suggests that the physical book interfaces of page turning is such a sophisticated technology that it will be hard to improve upon. He believes that as screen technology continues to improve, e-books will eventually become volumes of bound wafer thin screens (digital pages) through which different content can flow and change (Kelly 2000).

In the case of TWL on the iPad, however, the perennial problem of having just a single screen to show many pages of information remained.

Three aspects of TWL's interactive and user interface design – header popover, scrolling text and navigator visualisation – address the problem of navigating a multi-page text on a single screen.

Hierarchy

The first uses one of the literary conventions mentioned above. At the top of the screen showing the main poem text is a running header showing the title of the current section of the poem being read. However, the text label is interactive and one tap on it brings up a popover panel with a text menu list of the other sections in the poem (figure 27). Tapping once on a title of a section will jump the reader to that section of the poem, make the popover disappear, and accordingly update the header title at the top of the screen to indicate the new section that the reader has arrived at.
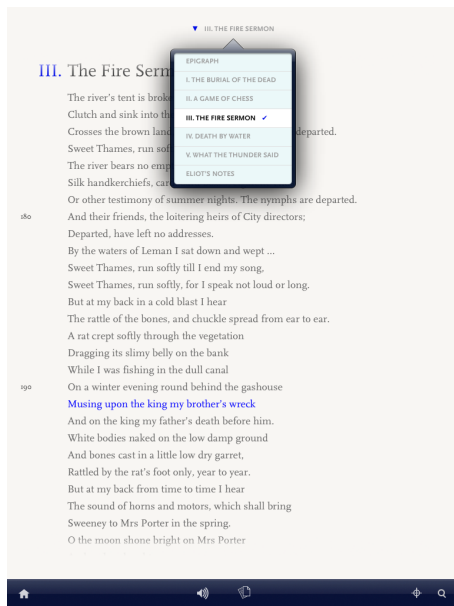
Figure 27. Header navigation popover showing the five sections within the poem.
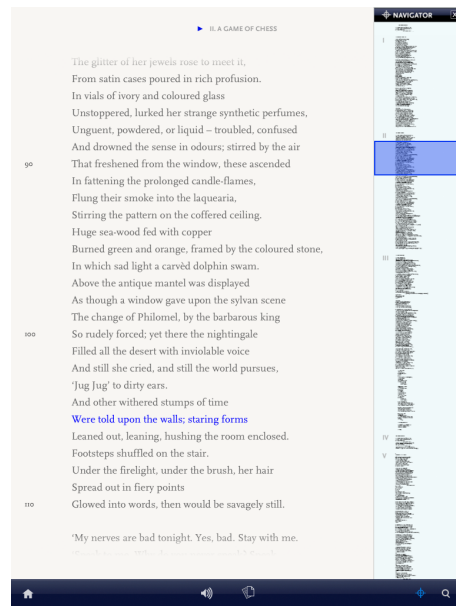
Figure 28. Navigator panel with blue highlight box showing the current portion of text displayed on screen.

The section header is set in small caps and a much smaller size to the poem text. The blue triangle arrow pointing to the header title is the only visual indicator that the header is interactive. It turns to point downwards once tapped and while the popover is invoked. The current section title in the section menu list is set in black and highlighted with a white bar and a blue tick symbol. These subtle yet detailed typographic styling changes make it apparent to the reader where they currently are in the text, and where they can go to.

Motion

The second interactive method, which enables the reader to move to a different section of the poem, might be compared metaphorically with turning to the next page. Instead of page turning or the use of page numbers on screen in TWL, the reader can continually scroll through the text of a section by pushing the text upwards with a swipe of their finger from bottom to top. When a reader reaches the end of a section, the poem text doesn't push up any further and bounces back slightly only to fade to the text of the next section.

The scrolling sensation on the iPad is very different to scrolling with a mouse or touch pad on a computer screen. On an iPad the user is directly moving the text with their fingers, pushing it up. In TWL, the design of the movement of the text as it reacts to this gesture is implemented closely to the way a user horizontally scrolls through images on the iPhone. The reader feels like they are tossing the text upward as it moves in response to their fingers. When the text begins to move, it gradually speeds up and then slows to a stop with a slight bounce before resting still, thus creating a very fluid sense of motion.

The design of the movement (of the scrolling text) is based on one of the traditional principles of classical animation called *slow in, slow out,* also referred to in animation software as *easing*. This principle was identified and matched to the 'motion' property of screen typography in the Practice Matrix.

Achieving realism in the motion design on an iPad is technically not a trivial undertaking. It involves the use of algorithms to control the inertia in the animation and would be difficult for designers to achieve without the available expertise of a programmer. It is a good example of

design specification requiring technical implementation and demonstrates the multi-disciplinary nature of creating an e-book.
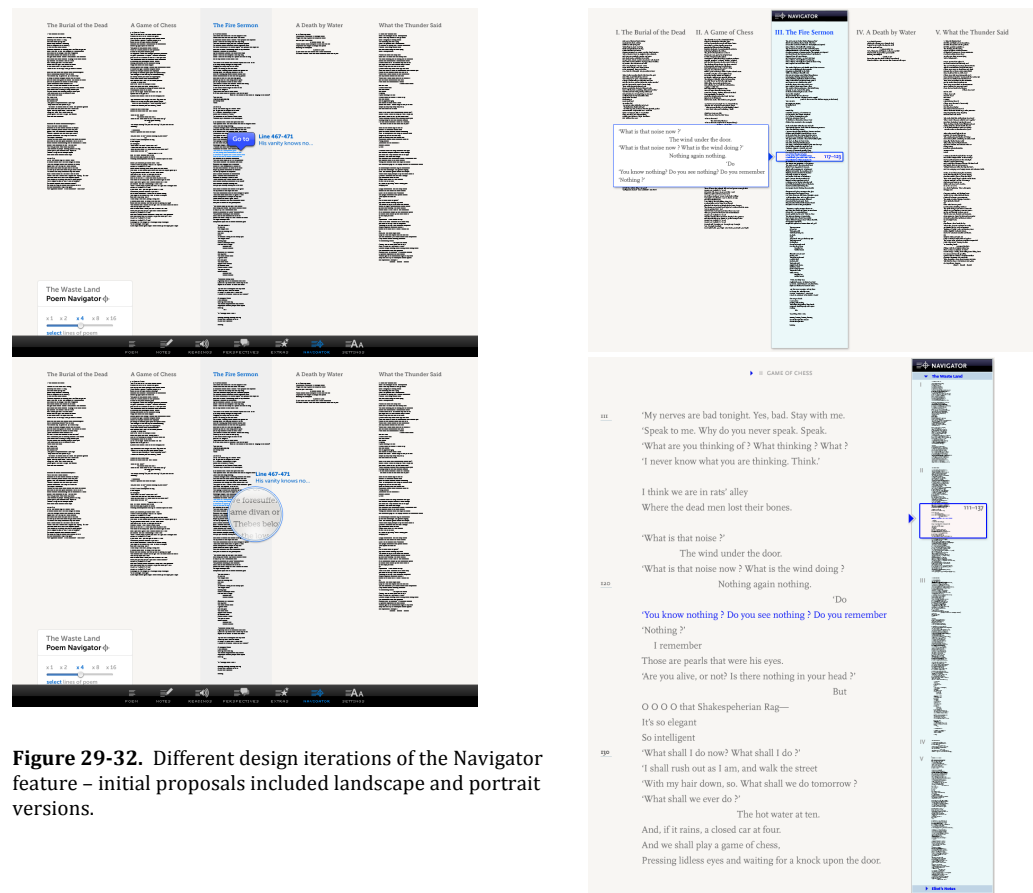
Figure 29-32. Different design iterations of the Navigator feature – initial proposals included landscape and portrait versions.

Visualisation

The third interactive method that enables a reader to navigate around the entire poem text is an interactive device that was designed and created specifically for TWL. In an attempt to overcome the difficulty of being able to see only a single page on the screen at one time, and because of the limitation of the iPad device to physically show the extent of the text volume in the way a printed book does, the researcher conceived a navigator device that provided a zoomed out view of the entire poem in miniature (see Figure 28).

The concept was influenced by the researcher's previous research and experience of designing data visualisation displays (Kenna, 2010), which uses the concept of macro and micro views of data, and also by the earlier design work of David Small's *Talmud Project* (1999) when he was a research student under the guidance of Muriel Cooper at MIT. Small and Cooper have published significant work on zoomable texts in three dimensional space, which enable the reader to view the text from far away in order to see its totality, and to zoom into a page to read the words (Small 1999).

The navigator in TWL is a simple panel containing a visualisation of the entire poem text in miniature. It is invoked by tapping the cross-hair icon on the bottom left of the navigation bar at the bottom of the screen. If the reader, slides their finger up or down on top of the highlight box on the panel (which is the equivalent of one screen of text at actual size), it will accordingly change the visible text on the rest of the screen in real-time. Equally, while the navigator is visible, if the reader scrolls the poem text up or down on the main part of the screen, the highlight box on the

navigator panel will move up and down in sync with those gestures. Effectively the navigator panel and the main body of text are linked together and each can interactively drive the other.

The navigator feature went through significant design iterations (see figures 28-32) to arrive at the simplified version currently published in TWL.

User-Interface

The high production values and careful editing of media rich content in TWL is evident in both the audio readings and video performance of the poem. A high level of design craft was also brought to bear on the graphic design, typography and animated transitions used in each element of TWL's graphical user interface.

The overriding design intent for TWL user interface was to create a deeply functional, easy to use, visually elegant but unobtrusive user interface (UI). Ultimately, the UI was designed to have minimal distraction from the reading experience but maximal functionality to enhance the reading experience.

Navigation Bar

Where possible, the explicit presence of UI elements is kept to a minimum throughout the App. The most consistently visible UI element is the navigation bar that appears at the bottom of the screen. It contains a home icon, and several other icons that provide relative functionality depending on the current section of the poem.

Figure 33. TWL navigation bar showing – Home icon, Perspectives icon, Readings icon, Notes, icon, Navigator icon and Search icon.

The simplicity of this feature was not arrived at easily. Again, an iterative design and testing process (like that promoted in the Practice Matrix), ensured incremental progression (figures 34) that resulted in the final form (figure 33).
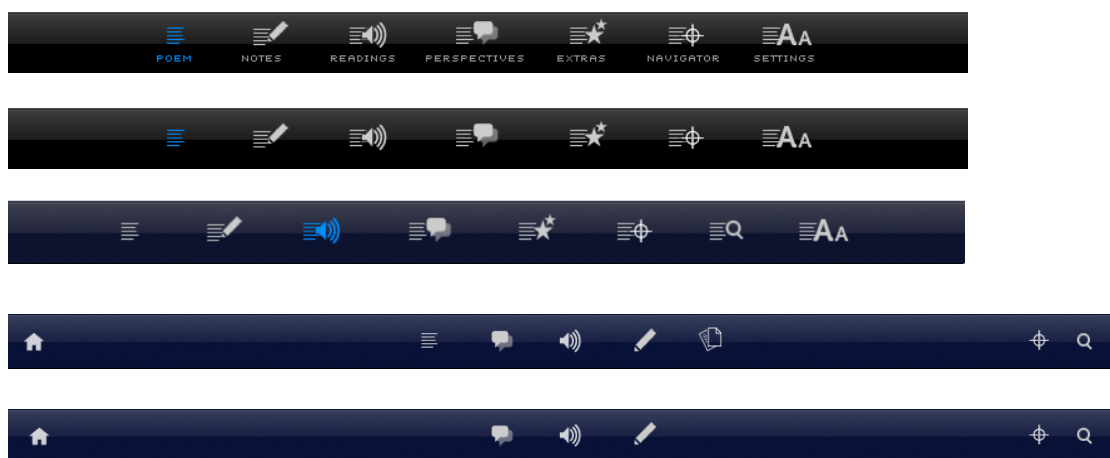
Figure 34. Different design iterations of the navigation bar and icons – one is progressively reductive.

Interactive Features

Other aspects of the user interface are often implicit or discoverable, hidden in the touch-based gestures with which the reader can explore the poem. Examples include, touching a line of the poem invokes a blue highlight, or swiping right to left over the poem text invokes an overlay of the relevant page of Eliot's original manuscript to fade up on top of the poem text (figures 6 & 7). Swiping in the opposite direction causes it to fade away again. Other implicit interaction control includes swiping left to right and right to left over video content to fast forward and rewind it respectively. A single tap on the video will start or stop it. There are no explicit video controls on screen, thus minimising UI clutter or noise.

Similarly, the in-built feature of physically turning the iPad device to change orientation from portrait to landscape mode or vice versa is used to great effect as part of the user interface of TWL.

The poem has for the most part been designed to display in both modes, but different features, invoked by changing orientation, are optimised for either landscape or portrait mode.

The *Notes* and *Perspectives* sections are only available in landscape orientation because their content necessitates the wider screen real estate of that orientation.

Notes

The Notes section of TWL was one of the most difficult parts to design because of the volume and complexity of critical annotations associated with the poem text. There is at least one annotation for every line in the poem, and sometimes there may be up to three different ones attached to the same line. The problem was how to typographically represent up to three levels of nested annotations that the reader could both easily read and access, as well recognise in association with a particular word, line or sequences of lines in the poem. Many design iterations emphasizing different typographic properties and styles were progressed to reach the final design, which comprises coloured grey bars of increasing darkness. The note in the left-hand panel highlights in synch with the line highlight in the poem. Touch either one will highlight both. The annotated notes are one of the most powerful interactive features of TWL. A full scholarly reference hidden in the interface is invoked at the touch of the readers' fingertips.
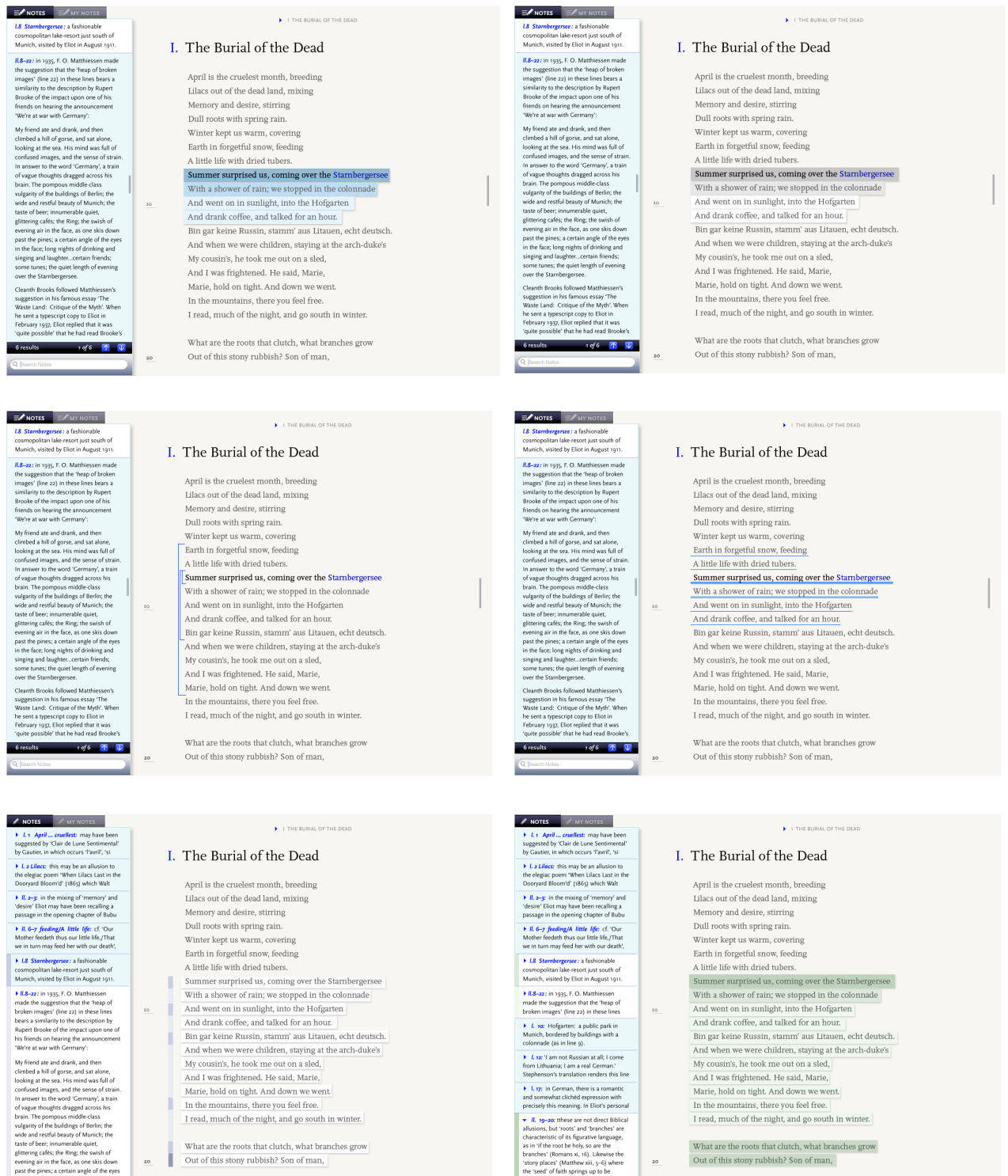
Figure 35. Different design iterations showing methods of typographic highlighting in poem text and notes panel.

Perspectives

The *Perspectives* section provide critical commentary on aspects of TWL

Figure 36. Different design iterations of the menu options to select one of the experts giving critical perspectives on TWL.
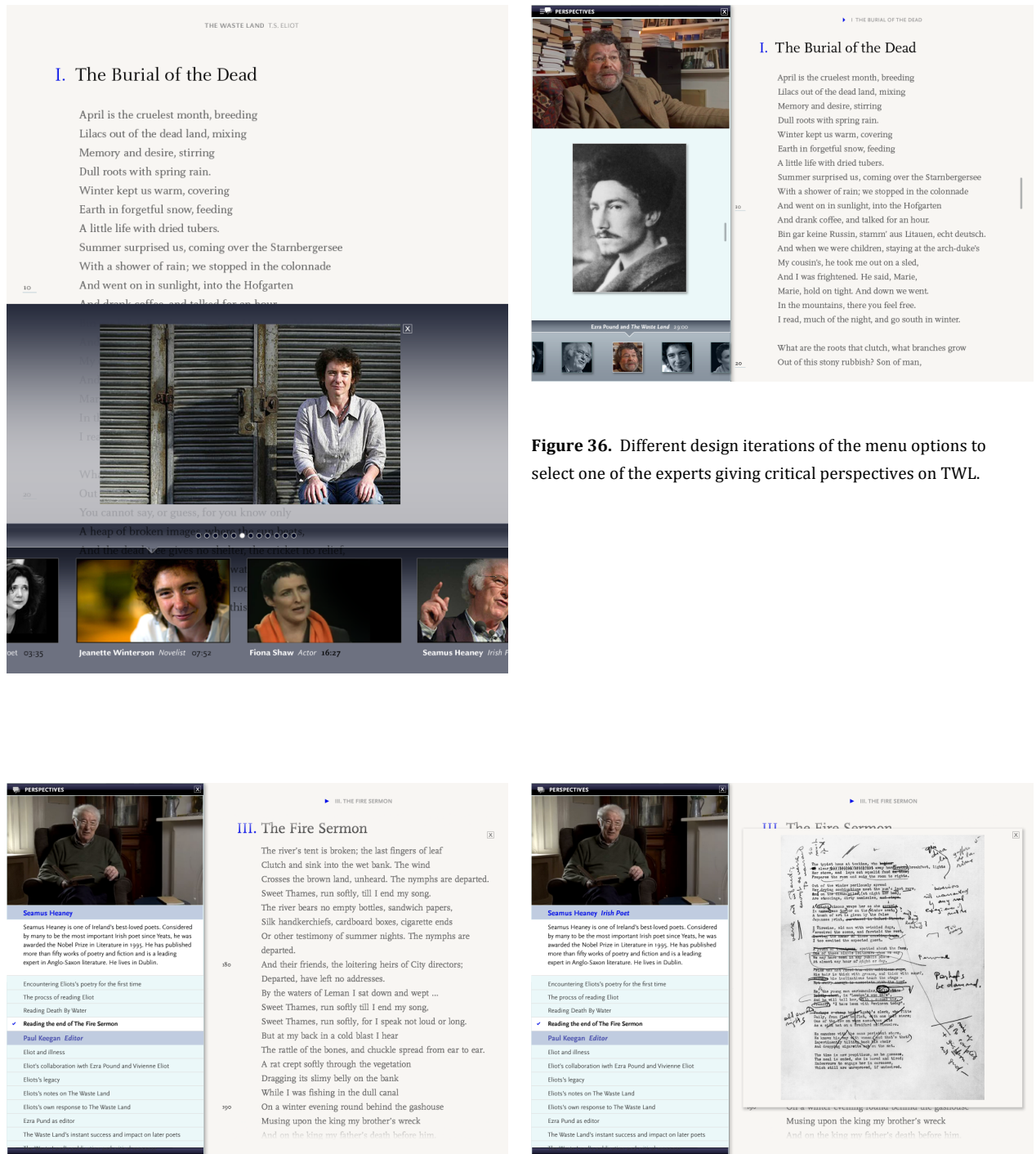
Figure 37. Different design iterations of the menu options to select one of the experts giving critical perspectives on TWL.

5. Conclusions and Future Work

Reader Review, Evaluation and Feedback

TWL App was released for international sale in June 2011 and became App of the Week at Apple's US store within a week. Since then, more than 20,000 people worldwide have downloaded it, proving it a commercial success for its publishers (Dredge 2011). For a brief period in July 2011, it was the number one best selling book in the UK App store. Subsequently, it has received more than 100 highly positive published reviews, posts and articles by customers, media critics (Lundberg 2011), the popular media (Appleyard 2011), the professional design industry (IXDA 2012), and literary academics (Hammond 2012) in different parts of the world. These include an editorial in the *New York Times* and an extended cover feature in the Culture section of the *London Sunday Times (June 2011)*. The production team has been interviewed on many occasions by international media including the BBC, public radio in the US and even a station in Brazil. Feedback from the audience has been overwhelmingly positive, with many people saying it has enabled them to appreciate and access Eliot's difficult but brilliant work (Appleyard 2011).

Impact

TWL App won best adult book at the Book Seller's Future Book Awards in 2011, and was a finalist in the Disruptive Category of the International Interaction Design Association's IXDA Awards in February 2012. Suggested as template for in digital literature (Sunday Times, 2011), TWL App has shown that it is possible to republish historical literary works in a new medium to a new audience. Members of TWL team have been invited to present at conferences including Future-book, Tools of Change and TED. TWL has also been acknowledged by literary academics and is being used in the classroom as a teaching aid – an activity for which it was not originally intended (Hammon 2012). It appears to have generally satisfied a wide audience without losing integrity: academics have welcomed it as openly as general readers. Former Poet Laureate Andrew Morton has publicly acknowledged that is caused him to buy an iPad, but more importantly it is encouraging poets not to resist digital publication.

Critique and Limitations

The diversity and range of user feedback and evaluation TWL App has generated would have been difficult to acquire through usability research studies and to date, this material has not been collated or analysed using any formal research methods.

There have also been a small number of negative reviews, most notably by Jeremy Noel Tod, of *The Times Literary Supplement*, February 2012. Tod has a number of criticisms. Firstly, that the App does not inherit the same high standards (evident in a print publication) of copy-editing and linked bibliographic references that he would expect from Faber. Secondly, Tod believes that the App's supporting 'critical apparatus' of content is outdated, partial and poorly edited. He considers the use of annotations from B.C. Southam's notes (1994) and the critical perspectives from BBC's *Arena* documentary (2009) should have been replaced with newer cutting edge material. Lastly, Tod's levels his harshest criticism at the lack of modern digital media features in TWL App in particular the inability for readers to create, share and save their own annotations.

Accepting these criticisms, it is worth noting that a *My Notes* section was originally designed for TWL but was one of the features cut in order to meet the publishing deadline (Figure 38).
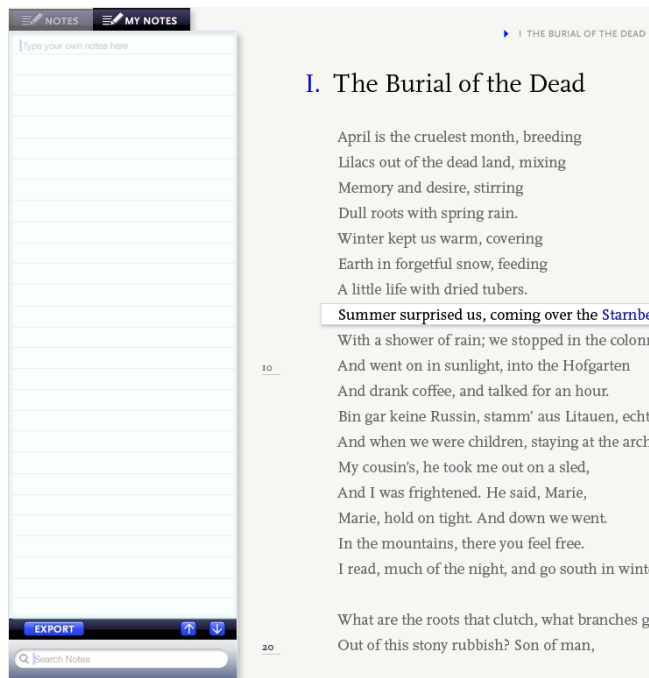
Figure 38. Different design iterations showing methods of typographic highlighting in poem text and notes panel.

In the context of the wider debate addressing issues of open and real-time content and reader contribution, TWL falls short. It does not address content or data outside what has been included by the publishers.

It remains traditionally authored in the sense that the publishers had complete control over the content. Despite this, there is much evidence in the range of responses to TWL App that the rich media content further engages the reader with the poem narrative and that there is undoubtedly continued merit, in the tradition of a single core narrative to engage the reader.

The innovations in TWL App are perhaps small scale when compared with technologies like *Flipboard*, or rich media interpretative narratives such as *The Fantastic Flying Books of Mr Morris Lessmore*.[3] Nonetheless, TWL App is an example of a well-crafted multimedia text with an easy-to-use and deeply functional interface. Some of its interactive features; such as the detailed notes annotations and the parent-child relationship between the video and textual content (which allows one to drive the other and vice versa), combine to make the sum of its parts a potential model for interactively exploring digital literature. On that basis, TWL makes a relevant contribution to the growing cannon of good examples of future book design.

A second edition is being planned for future release that will include features such as *My Notes,* the landscape version of the *Navigator,* and additional audio recordings.

---

[3] *The Fantastic Flying Books of Mr Morris Lessmore* is an interactive animated children's book with full screen illustrations, and an audio narrator synchronised with highlighted story text, *created for the iPad by Moonbot Studios in Los Angelas, 2010.*

References

Allsopp, J., (April 2000), A Dao of Web Design, A List Apart article,
http://www.alistapart.com/articles/dao/ (accessed: 21.11.11)

Apple Corporation Inc., (February 2010), *App Design Strategies*, IOS Human Interfaces Guidelines**,**
http://developer.apple.com/library/IOs/#documentation/UserExperience/Conceptual/MobileHI
G/AppDesign/AppDesign.html (accessed: 10.09.2010).

Apple Corporation Inc., (February 2010), iPad User Experience Guidelines**,**
http://uxmag.com/articles/ipad-user-experience-guidelines (accessed:07.01.2012).

Apple Corporation Inc., (February 2010), *User Experience Guidelines*, IOS Human Interfaces
Guidelines**,**
http://developer.apple.com/library/IOs/#documentation/UserExperience/Conceptual/MobileHI
G/UEBestPractices/UEBestPractices.html#//apple_ref/doc/uid/TP40006556-CH20-SW1
(accessed: 10.09.2010).

Appleyard, B., (June 26, 2011), iPads, eBooks and T.S. Eliot, Sunday Times,
http://www.bryanappleyard.com/ipads-ebooks-and-t-s-eliot/ (accessed 24.05.12)
Bennett, Alan (12 July 2009), Margate's shrine to Eliot's muse, *The Guardian*,
http://www.guardian.co.uk/books/2009/jul/12/ts-eliot-margate-shrine (accessed: 25.11.11).

Bridle, J., (October 2011), The New Value of Text, blog post on booktwo.org,
http://booktwo.org/note-book/the-new-value-of-text/ (accessed: 20.12.11)

Brockie, A., (Nov 2011), *The Guardian iPad edition: 'Put the newspaper on the iPad',* The Guardian
Online, http://www.guardian.co.uk/media/gallery/2011/oct/13/guardian-ipad-edition-design-
evolution (accessed:07.01.2012).

Carr, N., (July/August 2008), Is Google making us stupid?, Atlantic Magazine,
http://www.theatlantic.com/magazine/archive/2008/07/is-google-making-us-stupid/6868/,
(accessed: 30.11.11)

Coles, S., (April 2010), *What the iPad is Missing*, FontFeed, http://fontfeed.com/archives/ipad-
typography (accessed 28.09.10)

Collingridge, P., (February 2010), App Analytics, conference presentation at Tools of Change for
Publishing, O Reilly TOC Conference, New York.
http://www.youtube.com/watch?v=KOFLlZ9HH8w (accessed 11.12.11)

Dobbs, D., (Sept 2010), Is page reading different from screen reading?, Wired Magazine,
http://www.wired.com/wiredscience/2010/09/36037/ (accessed: 29.11.11)

Dredge, S., (August 8, 2012), *The Waste Land iPad app earns back its costs in six weeks on the App
Store*, The Guardian, http://www.guardian.co.uk/technology/appsblog/2011/aug/08/ipad-the-
waste-land-app (accessed 24.05.12)

EPub3.0 Specification, (January 2012), http://idpf.org/epub/30/spec/epub30-
overview.html#sec-intro-overview, The International Digital Publishing Forum (IDPF). (accessed
20.01.12)

Hammond, A., (April 17, 2012), *How Faber and Faber's iPad app rescues T.S. Eliot's masterpiece
from the waste land of print*, Toronto Review of Books,
http://www.torontoreviewofbooks.com/2012/04/how-faber-and-fabers-ipad-app-rescues-t-s-
eliots-masterpiece-from-the-waste-land-of-print/ (accessed 24.05.12)

Hockenberry, C., *Put Your Content in My Pocket* (Part I & II), A List Apart articles, http://www.alistapart.com/articles/putyourcontentinmypocket, (accessed: 21.11.11)

International Digital Publishing Forum, (October 2010), *Industry Statistics*, http://idpf.org/about-us/industry-statistics (accessed 22.05.12)

Kelly, K., (June 2000), We still turn pages, Time Magazine, http://www.kk.org/writings/time_turn_pages.php, (accessed: 3.12.11)

Kelly, K. (November 2008), Idea Lab: Becoming Screen Literate, New York Times Magazine, http://www.nytimes.com/2008/11/23/magazine/23wwln-future-t.html?pagewanted=1, (accessed: 3.12.11).

Keyes, R., (2006), *The Impact of Moore's Law*, Solid-State Circuits Newsletter, IEEE, Vol:20:3 pp. 25 – 27.

Leher, J., (Sept 2010), The Future of Reading, Wired Magazine, http://www.wired.com/wiredscience/2010/09/the-future-of-reading-2/, (accessed: 29.11.11).

Lundberg, J., (June 10, 2011), *Raising the Bar for Digital Poetry*, The Huffington Post, http://www.huffingtonpost.com/john-lundberg/raising-the-bar-for-digit_b_874764.html, (accessed: 24.05.12)

Marcotte, E., (March 2009), Fluid Grids, A List Apart article, http://www.alistapart.com/articles/fluidgrids/, (accessed: 21.11.11)

Marcotte, E., (May 2010), Responsive Web Design, A List Apart article, http://www.alistapart.com/articles/responsive-web-design/ (accessed: 21.11.11)

Mod, C., (April 2010), Embracing the Digital Book, Essay, http://craigmod.com/journal/e-books/, (accessed: 30.11.11)

Mod, C., (January 2011), A Simpler Page, http://www.alistapart.com/articles/a-simpler-page/, (accessed: 30.11.11)

Mod, C., (June 2011), Post artifact books and publishing, http://craigmod.com/journal/post_artifact/, (accessed: 30.11.11)

Mod, C., (March 2010), Books in the age of the iPad, http://craigmod.com/journal/ipad_and_books/, (accessed: 30.11.11)

Mod, C., (September 2011), The shape of our future book, Essay, http://craigmod.com/satellite/our_future_book/, (accessed: 30.11.11)

Neilsen, J., (May 2011), iPad Usability: Year One, Alert Box, http://www.useit.com/alertbox/ipad.html (accessed: 07.01.2012).

New York Times, Editorial, (June 11, 2011), *'The Waste Land' by App, http://www.nytimes.com/2011/06/12/opinion/12sun4.html?_r=2&smid=tw-nytimesopinion&seid=auto* (accessed 11.06.11).

Reichenstein, O., (April 2010), *Designing for iPad: Reality Check*, Information Architects (iA Inc). http://informationarchitects.jp/designing-for-ipad-reality-check/ (accessed 28.09.10)

Ruder, E., (1967), Typographie: a manual for design, Arthur Niggli Ltd, Switzerland.

Small, D., (1999), *Rethinking the Book*, Unpublished Ph.D. Thesis, Massachusetts Institute of Technology, USA.

Stein, B., (2004), Institute of the Future of the Book, mission statement, http://www.futureofthe-book.org/mission.html (accessed: 10.07.11)

Tashman, C. & Edwards, K., (May 2011), *Active Reading and Its Discontents: The Situations, Problems and Ideas of Readers*, CHI 2011 Proceedings, ACM SIGCHI Conference on Human Factors in Computing Systems. http://www.cc.gatech.edu/pixi/projects/ (accessed 25.11.11)

Tashman, C. & Edwards, K., (May 2011), *LiquidText: A Flexible Multitouch Environment to Support Active Reading*, CHI 2011 Proceedings, ACM SIGCHI Conference on Human Factors in Computing Systems. http://liquidtext.net/ (accessed 25.11.11)

The Publishers Association, (May 2011), *PA Statistics Yearbook 2011*, The Publishers Association, London, UK.

Tod, J. N., (February 20, 2012), A wasted opportunity, The Times Literary Supplement, http://www.the-tls.co.uk/tls/public/article875711.ece (accessed 24.05.12)

Tufte, E., (1996), Envisioning Information, Graphis Press.

Victor, B., (March 2006), *Magic Ink – Information Software and the Graphical Interface*, Essay http://worrydream.com/#!/MagicInk, (accessed 25.11.11)

Victor, B., (Nov 2011), *A Brief Rant on the Future of Interaction Design,* Essay, http://worrydream.com/ABriefRantOnTheFutureOfInteractionDesign/ (accessed: 25.11.11)

Wieck, S., (March 2010), *Books, Typography and the iPad*, blog post, http://blog.samwieck.com/post/457824073/books-typography-and-the-ipad (accessed 28.09.10)

Wisenbart, R., (Feburary, 2012), *The Global eBook Market – Current Conditions and Future Projectsion*, O'Reilly Media, Inc.

Speaker Biography

Hilary Kenna designed the iPad App of The Waste Land for its joint developer/publishers Touch Press and Faber & Faber UK. Hilary is a Lecturer in Design and Digital Media at the Dun Laoghaire Institute of Art Design and Technology (IADT) www.iadt.ie. She has over fifteen years international experience working as a graphic and interaction designer. She is currently completing her Ph.D. in Design Principles for Screen Typography at the University of Arts London. She writes a research blog www.type4screen.com.

Appendix IV – Interview Transcripts

Interview Questions for Practitioners of Screen Typography

BenFry, US Designer (1) and Data Visualisation Expert, Author, Aesthetics & Computing, MIT PhD Graduate.
Email Interview – Reply 29.11.2007

---

1. How would you describe the difference(s) between screen and print typography?

the two biggest are the most obvious: 1) on-screen resolution is terrible but 2) you trade that for the ability to change and update the display over time.

1a. Can you mention any examples of screen typography that you consider to be outstanding and why?

i think very highly of peter cho's work. peter is extremely creative and has consistently developed beautiful and insightful work since the late 90s.

---

2. In what ways has designing for screen impacted how you consider (or use) typography in your work?

i think the screen gets you thinking about the time element, and that when you go back to the printed page, that awareness of time and motion can still inform a static image because of the way that it opens your mind.

2a. Before going to MIT, you trained as a graphic designer, can you briefly mention your experience regarding typographic education and training?

i've been type obsessed since i was young, and typography was one of the primary reasons i studied as a graphic designer.

2b. Describe what/if any design principles for print typography you think are relevant to designing on screen?

nearly all of the principles still apply. in fact, you often have to follow them more closely with a richer (that's not quite the right word, but..) medium like the screen.

2c. Do you have any design or typography or design books on your shelf? (If yes, which do you refer to most and why?)

PhD Thesis: Appendix IV: Interview Transcripts © Hilary Kenna, 2012.

several, though nowadays i don't refer to them as much (i haven't been doing as much typography-oriented work recently). i usually recommend ellen lupton's book for people who are just getting started, for instance. i also read a lot online about how type works on the computational side—the "boring" bits like file formats and how to extract geometry and that sort of thing.

3. How would you describe your working methods as a designer (working on screen)? Describe what happens when a job comes in.

this varies a lot based on the project, but generally i go back and forth between code and writing in a sketchbook. on simpler projects i might start in code, and then move to my sketchbook when i get stuck. years ago i did more in my sketchbook before starting, but i can write code fairly quickly so it can still be a sketching process.

3a. Do you combine paper and screen-based methods in your practice and if so, how? Besides Processing, do you use any off-the-shelf software applications? If yes, which ones and why?

sure, i love doing work for print, occasionally for magazines or large-format prints. it's all still computationally generated, but it lets me take tens of thousands of objects and render them to a huge pdf or illustrator file.

for other tools i use illustrator quite a bit, though i'd love to be able to replace it with something else.

4. Can you describe what were/are the biggest influences that led you to focus on computational information design in your research and why?

just being curious about data...i was interested in design and programming as very separate things, and this was a way i could combine them in a manner that suited the kind of things i like to think about.

5. What is your general view of the design standard of contemporary screen typography?

the standard is low but improving.

5a. In your view, can you describe what aspects you think make for beautiful typography on screen?

consistency and attention to detail. that's mundane, but once that gets covered, we can get on to the more interesting bits.

---

6. What do you see as the key areas of future development in screen typography?

larger and higher resolution screens... ~200 dpi @ 18 inches away looks "real" to our eyes. it'll be nice to not notice pixels quite so much. current stopgaps like cleartype (microsoft's ripoff of an 80s technology) don't count and i can't way to see them go away.

6a.What (if any) new skills do you think graphic designers require in order to successful design for

screen?

start using motion very early on, so that it's part of how they learn, not some sort of "if you're good, you get to do *dynamic* type!" everyone needs to think about typography in the temporal domain, whether it's for a static purpose or not.

6b. As someone who has successfully crossed the creative/technical divide, and as the co-inventor of Processing, do you have any advice for designers who are struggling to reconcile creative and technical processes?

don't let either side win. you have to actively pursue both areas, otherwise your abilities atrophy in one area over the other. and stick with friends who are better at both—nothing is better than having friends who are better designers and better programmers to challenge you from both sides and keep you from thinking you're any good.

From: US Designer 1

Sent: Fri 11/30/2007 10:21 PM

To: Hilary Kenna

Cc:

Subject: Re: Questions for PhD Interview in Screen Typography

Hilary Kenna wrote:

> Hi ,

>

> Thanks so much for getting back so quickly, I was teaching today and was offline so I just got your mail now. I just read your replies, they are very insightful! Thanks for being so honest and succinct.

>

> I have two additional questions, if you don't mind.

>

> 1. When you studied graphic design - was typography taught in a formal systematic way or more as an integrated part of graphic design communication in general?

on paper it was to be systematic (typography 1, 2, and 3 courses), but

in practice it was more integrated, because the "typography" courses

were generic graphic design studios.

> 2. Do you think young designers should be learning to code as part of their curriculum in design?

yes. i don't think that means they need to make code part of their work, but i think it's important to have literacy with code. if you're going to spend the whole day sitting at the computer, it's important to know a bit about what's going on. but more interesting/important, unless you can write a little code, you'll always be limited to the capabilities of tools that you're sold. on this latter point, this is especially becoming pragmatic as the largest developer of design tools (adobe) now has a significant monopoly in the tools space, which is leading to mediocre results and limited improvements, because they have no "real" competition.

> Many thanks again, I will forward you further info on my research as it progresses!

good luck,

Interview Questions for Practitioners of Screen Typography

Peter Cho, US Designer (2), Interactive Typography, MIT MSc Graduate,

Email Interview – Reply 04.01.2008

---

1. How would you describe the difference(s) between screen and print typography?

I think they are distinctly different environments for reading and writing, with of course some overlap. Screen typography can incorporate animation and interactivity with the reader. Animated type can be more related to the spoken word than the printed page, expressing characteristics like tone, voice, stress, emphasis, even emotion. Screen-based interactivity leads to a whole new world of possibilities, which we've only begun to explore. Probably no one would dispute that print is still much better at many things, such as longer texts, portability, durability, resolution.

1a. Can you mention any examples of screen typography (besides your own work) that you consider to be outstanding and why?

I like the digital signage Lisa Strausfeld's team at Pentagram did for the Bloomberg building. That's another exciting possibility -- screen-based typography that finds its way into the built environment.

2. In what ways has designing for screen impacted how you consider (or use) typography in your work?

Unfortunately maybe it has made me sloppier in terms of following rules for "good typography." Still I need to try my best!

2a. How did you develop an interest in typography from your undergraduate education in mechanical engineering, design and computation?

I was always interested in letters from an early age, and started getting into using type in middle school, when I got my first Mac computer (a Mac plus!). When I got to MIT I thought I should study something practical, so started in on the engineering route, then incorporated computation and industrial design into my studies. But it wasn't until the Media Lab that I got to work with typography and combine my technical and artistic interests.

2b. Can you briefly describe what kind of typographic education and training you experienced, first at MIT, then at UCLA?

In college, I had a type class at MIT taught by Angelynn Grant and a summer internship on-job training with Jessica Helfand, but much of my typographic education was self-taught. I started learning about typography in high school, working as design editor of my school paper and designing ads at a local print shop. At UCLA I TA'd the intro to type class taught by Rebecca Mendez several times, which was a great education!

2c. Describe what/if any design principles for print typography you think are relevant to designing on screen?

I think most of the design "rules" for good print typography still apply to other environments. I wish there were a better way to talk about it, but I think a lot of the principles for making good type on screen rely on intuition, knowing what works well in print and being able to translate that into motion and interactive contexts.

2d. Do you have any design or typography or design books on your shelf? (If yes, which do you refer to most and why?)

Of course! Bringhurst is good, as well as the Thinking With Type book by Ellen Lupton.

3. How would you describe your working methods as a designer (working on screen)? Describe what happens when a job comes in.

I think my working methods are pretty similar to most others -- there's a proposal phase, a phase for research and design exploration, then a phase for implementation.

3a. Do you combine paper and screen-based methods in your practice and if so, how?

I still like to have things on paper, so storyboards are usually viewed on screen and printed out.

3b. Besides Processing/Java/C++, do you use any off-the-shelf software applications? If yes, which ones and why?

Yes, I use the Adobe suite, especially Photoshop, Illustrator, InDesign and After Effects. I've been using Flash for client work quite a bit lately as well.

4. Can you describe what were/are the biggest influences that led you to focus on dimensional typography in your research and why? And to create the TypoTopo website?

John Maeda was a big influence in that body of research. He helped encourage me to explore different models and possibilities for dynamic and dimensional type. Being at the Media Lab with the Visible Language Workshop as a precursor was huge as well. For TypoTopo, I just wanted to gather the work I've done with typography and mapping into one place, and make some of the studies availabe on the web.

5. What is your general view of the design standard of contemporary screen typography?

Hate to be a naysayer, but I think the design standard for type on screen today is pretty low.

5a. In your view, can you describe what aspects you think make for beautiful typography on screen?

I think the same as beautiful typography in print -- texture plays a big part, as well as contrast and depth.

6. What do you see as the key areas of future development in screen typography?

I would love to see more research into how aspects of interactive and dynamic media can be used to tell different kinds of narrative with typography. I love this chapter from Richard Lanham's book The Economics of Attention that talks about "What's Next for Text." It's an optimistic proposal for how screen typography can unlock the possibilities for how text has "wanted to be" throughout history in different explorations of textual messages from illuminated manuscripts to shape and concrete poetry.

6a.What (if any) new skills do you think graphic designers require in order to successful design for screen?

A keen eye for motion, a willingness to try new tools and new media. Good typographic sense. Good language skills, both writing and editing. Common sense and intuition.

6b. As someone who has successfully crossed the creative/technical divide, do you have any advice for designers who are struggling to learn technical methods and processes or how they might reconcile them with their creative practice?

I'm still working on this too in another way: how do you stay up-to-date with current technologies? Learning from colleagues and friends and employees. Reading books and keeping up to date online. I'm not sure the best way.

Interview Questions for Practitioners of Screen Typography

Khoi Vinh, US Designer (3), previously Creative Director of New York Times Online, blogger, developer and author with web typography specialism.

Email Interview – Reply January 2008

From: US Designer 3   Sent: Sun 2/3/2008 1:31 AM

To: Hilary Kenna

Cc:

Subject: Re: last questions on Screen Typography

Attachments:

View As Web Page

> Hi,
>
> From your last answer about the standard of screen typography as
> 'still maturing'. I was wondering if there is any one designer/
> company whose work you think distinguishes itself from the
> mainstream or who you particularly admire?

That's such a hard question. I think there's lots and lots of
interesting work going on right now. But I have to admit that I tend
to turn to the work in my design history books for inspiration more
often than I look around the Web for aesthetic inspiration. Of
course, for interaction inspiration, I have to turn to the Web. I
think that social networking, aside from being a hot trend, is
creating opportunities for lots of really great design. Facebook and
LinkedIn, to name two, are really great examples of terrific
interaction design. They're quite innovative, even if I personally
find both of them not particularly useful or interesting in and of
themselves.

> Here is my last set of questions. Again, you have indicated part

> answers to some of these already, but I really want to get your

> views on the future.

>

> What do you see as the key areas of future development in screen

> typography?

> (I don't mean this to sound vague - perhaps, it should be what

> areas/aspects/technologies do you see having greatest impact on

> screen typography in the future?).

Resolution-independent interfaces are really going to change how we

approach interaction design in general, and typography in particular.

Right now screen typography is fixed to a discrete pixel region, but

soon we won't know if our interfaces will be blown up large enough to

fill an HD-TV or down small enough to tuck inside an iPhone.

Experienced typographers know that setting type at 7 points is very

different from setting type at 48 points... it's going to be

interesting to see how screen typography adapts to this new innovation.

> What (if any) new skills do you think graphic designers require in

> order to successfully design for screen?

There's a lot to learn. It's not that the skills of graphic designers

working traditional media won't transfer over, but there's juts a lot

to learn -- too much for me to go into here. Suffice it to say that

almost every traditional graphic designer is completely unqualified

for screen design until they have logged a nontrivial amount of time

designing specifically for the screen -- regardless of how skilled

and experienced they might have been in print beforehand.

> As someone who has successfully crossed the creative/technical

> divide, do you have any advice for designers who are struggling to

> learn technical methods and processes or how they might reconcile

> them with their creative practice?

Have humility about the medium. It requires it.

> As ever, thanks so much for fitting this into your schedule.

Sure, hope it was what you were looking for. Good luck...

From: US Designer 3   Sent: Mon 1/28/2008 11:56 PM

To: Hilary Kenna

Cc:

Subject: Re: second last question on Screen Typography

Hi Hilary,

> I was delighted and surprised to hear that Design: Vignelli was

> your favourite design book. I too am a big fan of modernism and the

> international style. I believe there is a big swing back to it in

> contemporary design and that it is more relevant than ever now. On

> the practical side of my research I am developing a model for

> typography/design principles for screen using Emil Ruder's method

> as a foundation. I can tell you more about that later...

>

> Anyway, my last two questions relate to contemporary practice and

> to future practice - you have answered these in part through your

> other answers but here goes...here is the first one.

>

> What is your general view of the design standard of contemporary

> screen typography?

That's a tough question. I think the fairest answer would be that
screen typography is 'still maturing.' We've got a lot to learn about
how typography needs to change in digital media, as well as a lot to
learn about what we can bring over from print media.

> What do you consider to be the criteria for beauty (as opposed to
> good design) in screen typography? From your previous answers about
> the importance of usability and the limitations of web, is it even
> possible in your view to make beautiful typography on screen?

Criteria for beauty isn't something that I would commonly separate
from the criteria for 'good design' -- if what you mean by 'good
design' is functional, usable and user-focused. I tend to define
typographic beauty in screen design first by whether it's useful, and
second whether it takes the pains to translate the attention to
detail available in print typography -- to the extent that it's
possible to do with whatever screen product is at hand.

You replied on 1/28/2008 9:32 AM.

Hi Hilary,

> Thanks for your last set of answers - remarkably honest.
> Sorry for the open ended questions. I will try and be more specific.

No, not at all. I hope I didn't sound testy in my last email. I was
trying to knock out answers for you between deadlines.

> From the last email, regarding your process and methods...these
> questions below indicate what I was trying to establish - if you

> can answer yes or no, or elaborate in one sentence that would be fine.
>
> Do you sketch your designs/layouts on paper first before moving
> onto the computer?

At least three-quarters of the time, yes. I'm a firm believer in
trying to work out problems on paper first, even if it's very
preliminarily. One covers creative ground so much more efficiently
that way.

> Do you ever print out your designs and review them on paper (may
> seem like a crazy question for a screen designer!)?

Almost never. The beauty of working in digital media is that it's
very easy to preview one's work as in its actual final form (or very
close to it), which isn't often true with print. So I like to take
advantage of that by previewing on the screen.

> Do you ever use paper cut and paste methods for composition?

Never.

> Do you think coding a layout in HTML/CSS (especially with divs) is
> an abstract and difficult method for designers trying to visualise
> page composition?

If it is, it's only moderately more abstract than understanding
mechanicals for offset printing a few decades ago. Most designers are
entirely capable of it. And of course it's an essential skill for
understanding how the medium works.

> My next broader, but hopefully not to vague, questions relate to
> your influences...
>
> Can you describe what were/are the biggest influences that led you
> to focus web design/publishing as a career and why? What led you to
> create Subtraction and A Brief Message?

Designing for the Web appealed to me originally -- and still does --
because of the immediacy that it makes possible. Of course,
professional Web design can and must complicate this, but the Web is
still very much a medium where one can have an idea and make it
available to the whole planet, literally, within a few hours or days
and at very little cost. That just isn't possible in print, which is
why I gravitated to the Web.

Similarly, Subtraction.com and A Brief Message are vehicles for me to
create an editorial product and then design that product -- allowing
me to have an idea, then execute it with a minimum of fuss.
Subtraction.com is of course my personal outlet for all sorts of
ideas and rants, and A Brief Message is an opportunity to create
something a bit more lasting and universal -- and to work with really
terrific collaborators.

> What are your favourite design or typography or design books that
> you have on your shelf? Which ones do you refer to most and why?
>
> I think that the design of the Subtraction site is quite modernist,
> rather reminiscent of Swiss typography, was this intentional?

I can answer these last two in the same breath: my most prized book
is "Design: Vignelli" from Lella and Massimo Vignelli. It's a
beautiful compendium of their work through the late eighties. It's
very Swiss/International; I'm very devoted to this sensibility --
some would say too devoted -- because I think it's really a high
water mark for what design is capable of. But also because its
minimalist sensibility makes so much sense for the efficiency that
the Web demands. So, yes, any similarity that Subtraction.com shares
with Swiss typography is entirely intentional.

Cheers,

You forwarded this message on 1/29/2008 10:45 PM.

PhD Thesis: Appendix IV: Interview Transcripts © Hilary Kenna, 2012.

From: US Designer 3   Sent: Thu 1/24/2008 4:05 PM

To: Hilary Kenna

Cc:

Subject: Re: more Qs on Screen Typography

Hi,

> Thanks for the last installment, plenty of food for though - the
> usability aspect is one that designers tend to gloss over in favour
> of their own aesthetic concerns. I have a couple of follow up
> questions to the last email if that's okay.
> I was hoping you might briefly describe your experience regarding
> typographic education and training and what/if any design
> principles for print typography you think are relevant to designing
> on screen?

My art school training was in illustration, primarily. It wasn't
until the end of my time there that I realized what I really wanted
to do was graphic design. So I spent the last year and a half taking
as many design courses as I could. You could say that I got part of a
classical typography education that way. The rest has been through
reading and practice -- trial and error. I think it's absolutely
essential to have a traditional typography education in order to be
capable of good typography for screens. No question.

> The next new question I had relates to your working methods. You
> mentioned in the last email that you have 'adjusted to a view of
> the craft that acknowledges a far greater number of limitations'.
> Do you think that designers have to work much harder (be more
> creative/technically savvy) to achieve good results on the web than
> in print?

I think that's true. If you look design work on the Web, even the
work of many of the designers we celebrate, it's actually quite
boring. On its own merits, measured against the benchmarks of
technical constraints and sophistication, it can be very impressive.

But as a whole, most design and typography online is quite bland. It

takes a lot of hard work -- and often, a unique client -- to do

really good work.

> I have read your articles about Grids and how important they are in

> your current practice. I was wondering if you would expand a little

> bit about the rest of your design process. For example,

>

> How would you describe your working methods as a designer (working

> on screen)? Describe what happens when a job comes in.

This question is rather big and open-ended, so I'm going to punt on

it, sorry. If we can stick to narrower, more specific questions, that

would help me get through these more quickly for you.

> Do you combine paper and screen-based methods in your practice and

> if so, how? Do you use any off-the-shelf software applications? If

> yes, which ones and why?

I'm not sure what you mean...

> Once again, I know you have a crazy busy schedule, but I am really

> grateful for your response, whenever you have the time.

>

> Best wishes,

> Hilary

>

> PS. I have a couple of other questions after this...

>

>

> Hilary Kenna

> Lecturer in Design & Digital Media

> Programme Co-ordinator BA(Hons) in Visual Communication

> -

> IADT School of Creative Arts

> Institute of Art Design and Technology,

> Carraiglea Park, Kill Avenue,

> Dun Laoghaire, Co. Dublin,

> Ireland.

>

> T + 353 1 214 4676

> E   hilary.kenna@iadt.ie

> W   www.iadt.ie

From: US Designer 3   Sent: Mon 1/21/2008 5:45 PM

To: Hilary Kenna

Cc:

Subject: Re: another Q on Screen Typography

Hilary,

Your answer is fascinating! I have some questions about it...

I want to believe that typography on screen is not a poor relation of print - that is that it is possible to create a 'beautiful' reading experience on screen, not just one bound up with the functional/accessible aspect (GUI etc).

Do you think this is possible? Can you think of any 'poetic' examples of screen typography that interpret content in the manner you attribute to print?

For the next two decades, anyway, I don't think screen typography will be as beautiful and nuanced as print typography. I think digital media is currently preoccupied with developing universal conventions for interaction; there's too much uncertainty -- too much poor interaction design out there -- distracting from the focus and financial imperative that would be necessary to spur the creation of user agents (e.g., Web browsers) that are truly equipped to accommodate print-level typography.

Have you come across Richard Lanham's book 'The Economics of Attention', I wrote a post about his ideas about reading on screen. (http://www.type4screen.com/?p=52).

Anyway, you may not have time to look at this or expand your previous answer...but you have given me food for thought.

So, here is my next question...

For my benefit, I'm appending your questions and my answers at the bottom here, so that it will read a bit more like an interview.

How would you describe the difference(s) between screen and print typography? Or how would you define screen typography?

At a basic level, the difference between print and screen typography is not much different from the overarching tension that lies between these two media. The guiding principle of the former is narrative (i.e., How can a designer create the most controlled, singular expression of the content?) and the guiding principle of the latter is behavior (i.e, How does the designer accommodate the many different ways content and functionally will respond to inputs?).

These two modes of operation are mutually dependent in some ways, but in many ways they're irreconcilable, which is why I describe their relationship as a tension. The typography you see in screen designs is a reflection of the behavioral principle; like a button or a widget, it is only one component of the interface whose purpose is to help users achieve their goals. By contrast, typography in print is about creating a narrative, a beautiful, canonical interpretation of the given content.

In what ways has designing for screen impacted how you consider (or use) typography in your work?

Without a question, it's made me a poorer typesetter. Which isn't to say that I was ever a particularly brilliant typesetter. But on the rare occasions when I'm working in print -- or the even rarer occasions when I'm creating blocks of graphical text for the Web -- I'm amazed at how inept my skills are. Fixing ragged-right paragraphs, knowing when to break words and

when not to, typesetting footnotes, they all take much longer than they used to, for me.

I am interested to know how your current design/typography practice (for screen) compares with your practice in print.

Designing for the screen really requires an adjustment in typographic sensibilities. Just knowing that, for at least a small subset of the audience, there's a high likelihood that my design *won't* be rendered in the typeface I intended is pretty humbling.

In fact, thinking about user control is a huge part of typography for the screen. Inevitably, a large number of users will resize type via their built-in "bigger/smaller" browser controls. The best designs will retain some sort of elegance even when the user subverts the designer's original intention.

Combined that with the paltry selection of available (and reliable) typefaces for Web browsers, and a screen typesetter is forced to focus on a much narrower set of typesetting details. It's impractical to use drop caps or indents, for instance, so I've adjusted to a view of the craft that acknowledges a far greater number of limitations.

And then there are low-level functional concerns, too: for instance, ensuring the more esoteric forms of punctuation and typography (e.g., ampersands, accented characters, etc.) are properly encoded and not interfering with the actual HTML is very important. Or adding artificial spaces before and after em dashes to avoid unseemly line breaks. Some of these details are very minor, a little idiosyncratic, and very few people -- including other Web designers -- would ever notice them. But they're important to me.

You replied on 1/21/2008 12:18 AM.

From: US Designer 3   Sent: Sun 1/20/2008 8:38 PM

To: Hilary Kenna

Cc:

Subject: Re: Interview for PhD in Screen Typography

Hilary,
Again, many apologies for the delay in getting back to you. Here's an answer to your first question, I hope it helps.

How would you describe the difference(s) between screen and print typography? Or how would you define screen typography?

At a basic level, the difference between print and screen typography is not much different from the overarching tension that lies between these two media. The guiding principle of the former is narrative (i.e., How can a designer create the most controlled, singular expression of the content?) and the guiding principle of the latter is behavior (i.e, How does the designer accommodate the many different ways content and functionally will respond to inputs?).

These two modes of operation are mutually dependent in some ways, but in many ways they're irreconcilable, which is why I describe their relationship as a tension. The typography you see in screen designs is a reflection of the behavioral principle; like a button or a widget, it is only one component of the interface whose purpose is to help users achieve their goals. By contrast, typography in print is about creating a narrative, a beautiful, canonical interpretation of the given content.

--

You replied on 1/18/2008 1:13 PM.

From: US Designer 3   Sent: Fri 1/4/2008 10:25 PM

To: Hilary Kenna

Cc:

Subject: Re: Interview for PhD in Screen Typography

I'd be happy to. By email is probably easiest. I generally like to do email interviews as a back-and-forth dialog, rather than being presented with a list of questions. But whatever works for you.

On Jan 4, 2008, at 5:21 PM, Hilary Kenna wrote:

Dear,

I am a practice-based PhD student researching design principles for screen typography at the

London College of Communication under the supervision of Professor Teal Triggs. I am currently writing a review of contemporary practice in the area of screen typography, which I am planning to publish early next year as part of my research.

As you are one of the few leading practitioners in this emerging field, I was hoping you would agree to partake in an interview about your own practice, and your views on contemporary work in the field. I am aware that you have already given many interviews and are widely published, and I have endeavoured to read as much of this material as possible. However, I have some more specific questions relating to the topic of this research and would greatly value your contribution.

The title of my PhD study is Designing Typography for Screen - A Critical Examination and Exploration of Design Principles in Relationship to Contemporary Practice.
My research centres on the need for a better understanding of the nature of screen-based typography and whether we need new or updated design principles and practical methodologies for designing screen-based typography.

My research blog is www.type4screen.com, which I use as a tool to track and annotate significant developments in the field as they emerge. The site also contains more information about my research including a Practice Map that defines the territory of screen typography, a map of the relevant Literature that forms part of my literature review and many other relevant links.

Should you agree to be interviewed, I would like to explore ways in which designers define the parameters of screen typography and, more specifically your working methods and processes in relationship to the screen.

I would be very grateful if you could afford the time to partake in an interview for this research and I would be happy to conduct the interview by whatever method (telephone, instant messaging, email) is most convenient for you.

I am hoping to conduct the interview sometime in the month of January, and I would naturally work with whatever date and time suits your schedule.

I look forward to your response with anticipation, and really appreciate you taking the time to read this.

Yours sincerely,

Hilary Kenna

Hilary Kenna

Lecturer in Design & Digital Media

Programme Co-ordinator BA(Hons) in Visual Communication

IADT School of Creative Arts

Institute of Art Design and Technology,

Carraiglea Park, Kill Avenue,

Dun Laoghaire, Co. Dublin,

Ireland.

<u>Interview Questions – Creative Manager of Fís (Film in Schools), IADT 09.06.09</u>

HK explain background to the research – overview typography and design principles, overview of screen design, typography and motion graphics – emphasis on formal visual principles.

Background experience of education/training in the field,

- What are the core practical principles governing your discipline (film-making)?

- Can you describe your own training/education as a film-maker? (Was it academic or experiential, or both?)

- Was it traditional and if so, can you briefly describe the main aspects? (eg. what subjects, or what role you trained as)

- Did your education/training include any aspects of digital media? If so, what aspects?

In your current role,

- What do you consider to be the most important principles for students to learn?

- What are the core text-books that you use on your course?

- Can you describe the practical (and other) methods through which you teach these principles to students?

I am interested in applying/adapting traditional (and digital) methods and principles from film-making to the planning, shooting, editing of screen design and typography.

For example – **2D space** design principles for screen typography would include:

- Shot types (framing, camera angles)

- Format: screen aspect ratios – 4:3, 16:9 etc

- Rule of thirds and other surface divisions

- Safe areas etc

and methods such as shot lists, storyboard etc.

I have identified four key properties of screen design and typography that are different to print design and typography – **3D space, Motion, Sound** and **Interactivity**. Below is a list of some principles from film-making that are particularly relevant to these properties. (HK explain list below).

3D space

- Spatial grammar for continuity (180ºrule etc)

- Camera movements and staging

- Layers (foreground, middle ground, background) and opacity

- Depth cues for deep space, flat space, limited space, ambiguous space includes: perspective, distance, focus etc.

- Lighting

Motion

- Editing – continuity, **montage**
  (graphic, rhythmic, spatial, temporal)

Sound (Diegetic/non-diegetic)

- Synchronous (on the beat/exactly on action)
- Asynchronous (not on the beat/on action)
- Counterpoint (different/opposite)
- Accents (emphasis)
- Overlapping

How would you consider the relevance of these principles in relation to designing screen typography?

Do you think that the above covers the most important principles from your discipline?

Can you identify any major gaps or add other aspects that may be relevant?

Here are some key books that I have found particularly relevant – can you add any other books to this list that are widely used in education/training for film-making and which you think are particularly relevant from a practical perspective?

Booklist

Barnwell J., (2008), The Fundamentals of Film Making, AVA Academia, London.

Begleiter, M., (2000), From word to image: storyboarding and the filmmaking process, Focal Press.

Block B., (2001), The Visual Story – Seeing the Structure of Film, TV and New Media, Focal Press.

Brodwell D. & Thompson K., (1993), Film Art – An Introduction, Mc Graw Hill Inc.

Eisenstein, S., (1986 paper edition), The Film Sense, Faber and Faber, London.

Katz S. D., (1991), Film Directing – Shot by Shot, Visualizing from Concept to Screen, Michael Wiese Productions.

Rees A.L., (1999), A History of Experimental Film and Video, British Film Institute.

Vineyard J., (2000), Setting up your Shots, Michael Wiese Productions.

Wees W. C., (1992), Light Moving in Time – studies in the visual aesthetics of avant-garde film, University of California Press.

Interview Feedback/Response

HK explain PhD and what its about, reasons for interview.

HK want to interview Ciaran specifically about the traditional principles of film making and whether they can be applied to screen typography and design.

Background/Education

Started out as a magician, put himself through college as a student.

Did film at IADT, was primarily interested in sound. Had a hearing difficult as a kid.

Specialised in film production – focused more on managerial aspect of film making rather than creative.

Aileen spotted Ciaran's link as a magician and tv work with Fís – was also working part-time as a lecturer in IADT at night on the film courses.

Also working for TV3 doing magic spots with kids, had his own company at the age of 19.

Then when he was 20 started working on Fís and that was seven years ago. Gave up magic, wound up the company and works full time now in IADT.

Also did a Masters in Digital Learning in St. Pats (finished in 2007).

Now his role is media education, not just film – eg. now working in digital media.

Completely self taught in terms of digital media – in all aspects.

Fís was the first educational institute in the country to podcast.

He is also a certified Final Cut Pro trainer and the first Apple Distinguished Educator in Ireland – which means he is responsible for all of Ireland – is leading the way in education.

iLife for lower end is for 3-13year olds.

Final Cut Xpress and

Approach to technology is for it to be the enabler, not for it to get in the way of the creativity. Get them doing basic editing in an hour

Fís does the schools – they set up the training infrastructure through the education centres in Ireland – 21 centres in Ireland, they have ICT advisors, we train them as Fís co-ordinators and they train the teachers…so we are responsible for training about 400-500 teachers in Ireland.

They are linked to NCTE – first is the pilot project to be mainstreamed throughout Europe.

They have a very good network with the NCCA.

Current role

Can you talk about your role as an educator/trainer? What are the most important principles that you teach starting out to teachers?

Well, actually, what we teach is not even media principles, its about getting over the fear of using computers and technology in general. Teachers can't use computer – have to be introduced to technology – right down to a mobile phone.

Then they need to learn about media as a creative tool – have to get them to buy in – so much so, first day of a three day course is all about the methodology, then curriculum integration – integrated into your own teaching practices, classroom time.

Primary school – 12 subjects, classroom management – all linked together – eg. Fís have designed a whole day where teachers can do film that is linked into all subjects in a day's curriculum, for example take the theme – make a two minute animation on nature –

Topic is nature, research is nature, might have a historical element which is history, then they have SPHE (Social Personal and Health Education) which is drama, then creative writing which is English, also music which is also curriculum.

Its more difficult in secondary school where teachers only have 45mins, that's why most media based activities happen in transition year where there is more flexibility.

Second day of training is about being a film maker – cut it all right down, so they are focused on breaking it down into roles – mainly because you have 30 children, can't have 4 of them making the film and the rest watching... so

We teach them about all the different roles – a role for everybody

5 on continuity, and storyboarding for each tim, about sound, 1 on boom operator, someone as assistant camera, director, assistant director, production designer, casting, clapper board etc.

Each of them understand there is a role for everyone.

Day three is on editing, using credits and titles and the film itself.

How do you help them plan the visualisation and staging those shots?

Amazing how if you watched a student film and asked to see the storyboard, they would be totally different. Very rare that the storyboard will represent the film.

In comparison, a primary school film will be exactly like the storyboard. Fís have digitized storyboards that they put beside the film for teachers to see during the training sessions. The storyboard is often done two months before the film, but its still identical.

The reason being with the kids, work with the process that the sb is a map and they will stick to this, they are used to rules and will abide by the rules of film making. Also, they will only have a maximum of 3:1 ratio of footage – so for a five minute film they will have shot 15 mins.

If you got to a student film, they will have shot 3 or 4 hours (particularly if its digital). Also, the storyboard will be done by a storyboard artist and the will be the director's vision – often the first time that the crew see a storyboard is on set! They may have a couple of production meetings beforehand, it'll be more about the story but until they try to shoot it, then they realise what bits of the story will work.

Difference in the school environment – is the whole class works on the storyboard, the whole class makes the story, everyone has an input

Because we do improvisation in creativity with the kids and use storyboard software called Comic Life (€20), you can take real life photos and drop them in and put speech bubbles on them...so that's their essays

So how do you get children with literacy skills – dyslexic kids etc, but when you give them the tools they can – we give them a still camera, tell them to act out the story and be in it...

But how can you shoot a film without a storyboard – its so complex,

Look at animation, because they will always follow the storyboard, same in class of children.

How do they set up the shots in a scene?

Will improvise if its not working on set. May often use a blue screen.

Will also use a shot list – but often, it's a lack of experience, they will have crossed the line etc, may have to try different ways to get the shot. Also, students are anal about the technical aspects, want it to look great, but story is often second. Higher challenges.

Kids are not so worried about the shots but more about the story.

How are principles taught to you – do they tell you, show you, make you do it?

Yes, all three. You see it, read it, go do it, mixture of theory and practice.

How you would apply some of these things to non live action, eg. abstract or motion graphics etc?

Yes, have you seen our promo videos are text based and motion graphics – target audience is the teachers, not the kids – all our promos are text based (eurocreators, digitalcreators, fisbookclub).

So for example, the Fis Book Club, it's a massive project on literacy, no way we could list all the learning outcomes for teachers – but have to get them to buy in to it so...

So we based our rule of thumb for our story on we have 90 seconds to tell our story – we have 10 points that we want to make in a story – and in reality, we can only have 8-9 words in each point. So basically all of our stories are 80 words long.

With that how do you do that, break all stories into 10 points – with 8 words for each.

Each of the points swishes on.

For kids, all of the typography is used solely for credits – its incredibly important for their achievement.

Example of children with special needs children making a film and composing a song – used subtitles in case you couldn't understand the words.

Less about the art of typography, more about the message it displays and its importance.

Which principles would you separate for s2D and 3D in relation to film? Do you agree it's (storyboard) a plan of 3D space with annotation?

Where do shot types and framing sit – under 2D or 3D.

CMC - thinks storyboarding are 2D but really they use 3D directions so it's a bit of both. Camera movements are left or right, moving forward, or moving in etc.

They base everything on teaching children 3 shots...close shot, mid shot and wide shot

and after that they make their own shots up.

Very interesting that they make their own shots up and describe these shots in their own language which the class understands – eg. super wide shot etc.

Also there are very few title sequences, but you will get 2D motion title sequence, heavily influenced by CSI. Learning and heavily influenced by TV and CSI.

Bigger grasp of three letters.

In term of 2D space – do you teach rule of thirds?

Yes, primarily teach them not to centralize the character. They are thought the rule of thirds in art, so its quite easy to transfer this knowledge. Also, they learn about foreground, mid ground and background in art too.

Eyelines is not something that is taught too much.

Also teach them continuity and reversals, they learn this by doing.

We would teach them crossing the line and it comes under 3D.

They make their film with one camera.

More about the process than the final outcome.

Discuss the movement of the camera versus the editing of those shots in motion and time – but where does it come under my headings?

In filmmaking, the process is classified in three stages – pre, prod and post.

Pre and post are linked – storyboard is very much linked to editing.

Doesn't happen in industry – in TV, it never happens eg. 5 mins magazine style inserts, they might should an hour, no storyboard, make all their decisions in post.

Good and bad aspect of digital video, can shoot more but causes longer in post.

Finds its amazing how kids can be so precise with their shooting and editing. Every piece of footage will be there for a reason, because they have a storyboard.

Editing – what are most important factors?

Achieve what you want in your storyboard in the shortest amount of time.

In school context, they do editing by committee – two kids on the machine, up on a big screen, they vote on the shots to use.

Brilliant, kids love it, because they all feel they made it – they are all happy with the final outcome.

The basic functions of editing – take out footage you don't want, arrange a story in the concept that you need and

Then you come to the craft of editing, the style, how you do it, how you get from one place to another, the beat, the timing...

How do you teach beat and timing in editing?

We have a brilliant way of doing this, we teach them this through Harry Pottter, show them a scene from Harry Potter 1, where he is in the castle on his own, on his birthday when Hagrid comes to save him.

What we do it, we play the film without the visuals and tell them that there is a story there and about how important the audio is...also talk about radio

Then we ask them what they thought, get them to write it what they think is happening – whether it was a monster or a dragon etc. Its very interesting because they all write something different...

Then we show them what it actually was – then we talk about the visuals and audio together, about the mid shots, close ups, wide shots etc.

Then we talk about editing...and the relationship between the audio and visuals and the timing and we do this fantastic simple exercise with them.

We use this scene again to show them.

So we tell them that every time the picture changes – a cut in other words – when the picture cuts from one picture to another, we ask them to clap so the kids clap..

At the beginning, the scene is slow so the clapping is slow, then it starts to speed up when Harry is banging on the door and the clapping gets faster as the editing gets faster and faster...

and then at the end of the sequence, it slows down again.

So basically the kids understand editing in five minutes...and can talk to you about it after that.

Then you start asking them about different scenarios – and whether it would be slow or fast editing eg. what if the scene was two adults in a restaurant over candle light? Would it be quick?

They say no, slow and boring.

They get the concept of what the importance of editing is.

We do a lot of films that are carry minds which is lego projects. Using Lego for special effects...eg. lego trains, run away train is a lego train – very quick editing. So they have a basic understanding of the concepts at 6 or 7 which they can implement.

What about the beat, rhythm, how does it work in film compared to animation where sound is formally broken down? Do you ever draw the beat, rhythm of the film, get an overall picture of it, or is it done in the editing process?

No never have done this – narrative has always been determined in the editing. Can tell the style of an editor by their beat, rhythm.

Works very differently. Because silent scene, moments can determine the beat or rhythm of a film. Essentially, it goes down to the editing of the narrative – which may be done by the editor in conjunction with the director.

With kids we encourage them to edit to the beat of the sound – that is make a cut on the beat of the music.

Using music in their films is okay because of the very lucky situation - Fís have an agreement with IMRO that the kids can use any music on their films including for viewing at festivals – it took 3 years to put this agreement in place.

In that case, the kids base it on a song – and edit to the drum beat in the song – they base their music choice on the style and words of a song – could be loads of songs in a kids film. Might be selected before the film is edited, can be selected by the class....if its historical, they will choose classical, if its sci-fi they will choose ravey or poppy, they also use sfx from libraries or ones they use themselves.

Not so good at editing on action sounds – eg. door banging etc, even though they are taught this.

They try to use them – other times, they are willing to abandon editing style to tell the story.

Sometimes the teacher intervene.

Fís Awards –

Have an issue broadcasting the films online, but the issue is music copyright

EuroCreator is a pan European online site for broadcasting the children's films.

Fís is a lot bigger that people in IADT realise – HK suggest that they should make a documentary about Fís and the process of how teachers and kids are trained – and end result is award ceremony.

Ampersand and P3 are all on the same floor in the Media Cube.

Motion – what are the most important aspects?

Opening and closing sequences and using text to help tell the story.

Editing is also most important to sound.

What about editing to the beat?

Some of the stories are historical – with real costumes, etc – use classical music with montages at the beginning – montages setting scenes – long shots of landscapes etc often with traditional music.

Phrasing, accents doesn't mean anything.

Cutting on the beat is the main aim – teach them the traditional way

Editing – does it sit in motion or does it sit in 3D space ie. that through the editing process you construct the space through the editing process. BUT thinks there are a lot of people who would disagree with him.

Think it fits more in motion. 3D space is constructed through the camera. We put emphasis on framing, even tell them to lock off the zoom and focus on getting the shots. Focus is totally on the 3 shot grammar.

<u>Interview Questions – Animator, script writer, Lecturer in Animation, IADT
19.06.09</u>

HK explain background to the research – overview typography and design principles, overview of screen design, typography and motion graphics – emphasis on formal visual principles.

Background experience of education/training in the field,

- What are the core practical principles governing your discipline (animation)?

- Can you describe your own training/education as an animator? (Was it academic or experiential, or both?)

- Was it traditional and if so, can you briefly describe the main aspects? (eg. what subjects, or what role you trained as)

- Did your education/training include any aspects of digital media? If so, what aspects?

In your current role,

- What do you consider to be the most important principles for students to learn?

- What are the core text-books that you use on your course?

- Can you describe the practical (and other) methods through which you teach these principles to students?

I am interested in applying/adapting traditional (and digital) methods and principles from animation to the planning, animation and editing of screen design and typography.

For example – **2D space** design principles for screen design and typography would include:

- Shot types (framing, camera angles)

- Format: screen aspect ratios – 4:3, 16:9 etc

- Rule of thirds and other surface divisions

- Safe areas etc

and methods such as shot lists, storyboard etc.

I have identified four key properties of screen design and typography that are different to print design and typography – **3D space, Motion, Sound** and **Interactivity**. Below is a list of some principles from animation and film-making that are particularly relevant to these properties. (HK explain list below).

3D space

- Spatial grammar for continuity (180ºrule etc)
- Camera movements and staging
- Layers (foreground, middle ground, background) and opacity

- Depth cues for deep space, flat space, limited space, ambiguous space includes: perspective, distance, focus etc.
- Lighting

<u>Motion</u>

- Line of action

- Squash & stretch (weight & volume)

- Anticipation / staging

- Straight ahead or Pose to pose

- Follow-through & Overlapping Action

- Slow in / slow out

- Arcs

- Secondary Action

- Timing

- Exaggeration

- Solid drawing

- Appeal

Timing

- Frame rate / speed

- Picture / sound synch

- Phrasing

- Accents

- Texture

- Counterpoint

Editing – continuity, **montage**

(graphic, rhythmic, spatial, temporal)

<u>Sound</u> (Diegetic/non-diegetic)
- Synchronous (on the beat/exactly on action)
- Asynchronous (not on the beat/on action)
- Counterpoint (different/opposite)
- Accents (emphasis)

How would you consider the relevance of these principles in relation to designing motion?

Do you think that the above covers the most important principles from your discipline?

Can you identify any major gaps or add other aspects that may be relevant?

Here are some key books that I have found particularly relevant – can you add any books or web resources/dvds to this list that are widely used in education/training for animation and film-making and which you think are particularly relevant from a practical perspective?

<u>Booklist</u>

Animation

Blair, P., (1994), Cartoon Animation, Walter Foster Publishing Inc.

Byrne, M., (1999), Animation: the art of layout and storyboarding, Mark T. Byrne Production.

Cristiano, G. (2007), The Storyboard Design Course, Thames & Hudson.

Faber L. & Walters H., (2004), Animation Unlimited – Innovative Short Films since 1940, Laurence King Publishing , UK.

Halas J., (1987), Masters of Animation, BBC Books.

Hart, J., (1999), The art of the storyboard : storyboarding for film tv and animation, Focal Press, London.

Le Grice, M., (2001), Experimental Cinema in the Digital Age, British Film Institute, UK.

Horrocks R., (2001), Len Lye, Auckland University Press, New Zealand.

Mc Cloud, S., (1993), Understanding Comics, Harper Perennial, N.Y.

Moritz, W., (2004), Optical Poetry – The Life and Work of Oskar Fischinger, John Libbey Publishing and Indiana University Press.

Patmore, C., (2003) The Complete Animation Course – the principles, practice and techniques of successful animation, Thames and Hudson.

Russett R. & Starr C., (1976), Experimental Animation – Origins of a New Art, A DA CAPO Paperback.

Thomas F. & Johnston O., (1981), The Illusion of Life, Hyperion.

Wells, P., (1998), Understanding Animation, Routledge, London.

Williams, R., (2001), The Animator's Survival Kit, Faber and Faber.

Film-making

Barnwell J., (2008), The Fundamentals of Film Making, AVA Academia, London.

Begleiter, M., (2000), From word to image: storyboarding and the filmmaking process, Focal Press.

Block B., (2001), The Visual Story – Seeing the Structure of Film, TV and New Media, Focal Press.

Brodwell D. & Thompson K., (1993), Film Art – An Introduction, Mc Graw Hill Inc.

Eisenstein, S., (1986 paper edition), The Film Sense, Faber and Faber, London.

Katz S. D., (1991), Film Directing – Shot by Shot, Visualizing from Concept to Screen, Michael Wiese Productions.

Rees A.L., (1999), A History of Experimental Film and Video, British Film Institute.

Vineyard J., (2000), Setting up your Shots, Michael Wiese Productions.

Wees W. C., (1992), Light Moving in Time – studies in the visual aesthetics of avant-garde film, University of California Press.

Interview Feedback/Response

Timing - **beat and texture** is most important principle – but arguably it can not be taught.

It can be demonstrated, but students individual capacity to do it is innate, their awareness of it can increase and they can learn it as a technique but really good/beautiful timing is a natural instinct not necessarily a learnt one. Almost **zen** like.

Discussion of **terminology** – thinks principles include laws (craft techniques) and a creative mindset (this is what makes them good). Anyone can learn and master craft – but applying them creatively with flair is where talent, inate ability plays out.

Tent poles – 3D, Motion, Sound, Interactivity

Under each of these areas, interrogation of practical principles and methods – especially from other disciplines (film making, animation, interaction design).

Background

Currently

Lecturer in Animation

Programme Co-ordinator of BA(Hons) in Animation

Institute of Art Design and Technology, Dublin, Ireland.

Education

1989-92 – 3 years in Ballyfermot College of Further Education, Diploma in Classical Animation

5 days per week, 6 hours a day with a pencil or charcoal

High end drawing and design skills to reflect a feature industry

Industry in Dublin

Murakami Wolf, Emerald City, Sullivan Bluth – traditional animation structure in terms of employment

Cell painting, clean up, in-betweener, assistant animator to Directing animator

Entry level is by test

Difficult in Ireland to make animator grade

Evening training programmes and education of workers

To move up – test: give 2 drawings and give you a time to do it – the result was then tested by animator (by flipping and they would decide if it was of a standard) – meritocracy.

Initial technology was very simple – line test with VHS

Mainly interested in training excellence in the individual roles, not interested in moving people up, wanted brilliance in each level.

Main way to get ahead was informally talk/visit the animators and other facets of the production

BA in Animation Production, Wolverhampton, 2004

MA in Screenwriting, IADT, 2005.

Doesn't use computers enough – no problems using them, but unless you are doing it everyday, then you forget.

(HK – dichotomy between animators who are technically brilliant but whose motion is poor)

He Man – very figurative but hardly moved

Now dialogue in children's programmes is really interesting – eg Fosters

3D environments and

Much more democratic, coming from many quarters, anyone can now publish.

Most Important Principles to be an Animator (performance)

Timing – can be learnt, but texture can't be learnt

Texture can be applied to everything – performance, timing, weight, volumes

Comes when you put everything together – but it's a feeling when you put all of the building blocks together (weight motion, squash n stretch) – texture is a combination of everthing

Simplest way to understand it is when studied in relation to timing.

Example – perfect lip-synching but looks poor because it has got no **beat**!

Beat can however be over used as an aesthetic / technique in script writing

Should be use sparingly, cleverly

PhD Thesis: Appendix IV: Interview Transcripts © Hilary Kenna, 2012.

Actors hate to see the word **beat** in a script because they think it is their job to interpret where the beats go.

Beat & Texture

In screen writing terms, it means a momentary pause on thought of delivery, reflective moment between two parts that makes the two parts better than their original delivery without it.

Eg. I love you   or   I (beat) love you

Actors do it instinctively – think scriptwriters are good at English, they interpret where beats are.

(texture applied in a performance mechanism)

In animation beat may be explained in this example:

Eg. Picking up a phone.

Background elements can be added to make it look interesting but...

A movement and an action should never be the same, so you don't go over on an arc and back on the same arc – should go under, pick it up in and go down.

How its taught in animation is by 'The Salute' example – hand up in one way long way up, down in another, short way down – this is to ensure that the movement is not even, lifeless.

(texture applied in a movement mechanism)

Then there is how movement is actually timed....

Slow in, slow out.

(texture applied in timing mechanism)

THIS CAN'T BE TAUGHT as such!!

Is awareness half way to learning to create texture in their work

Yes, if its pointed out, students will recognize it, but they can't replicate

They can practice and learn it, and eventually will be able to use it as a technique.

In Film –

Timing is achieved in the **editing** of a film

A talented editor – will be make

The best editing usually comes when they have poor footage to work with and a good editor can shape it into something good.

Two examples in animation –

Some students can be technically brilliant in terms of technique but not good at pulling it all together.

Others have a really good end game – they can pull all together really well at the end.

Like applying the texture in a broad-brush stroke at the end, rather than fine detail all the way through.

Beat in Screen writing

Many writers don't even understand it or grasp it.

Understanding and applying Beat is not prescriptive – it has to be applied naturally, has to be inherently understood and come in a free flow form

Drawing of dramatic curve – what is the momentum of the piece over the 30 secs?

Practical method for **documenting the overall plan or beat of a piece**

[Diagram of Dramatic Pitches]
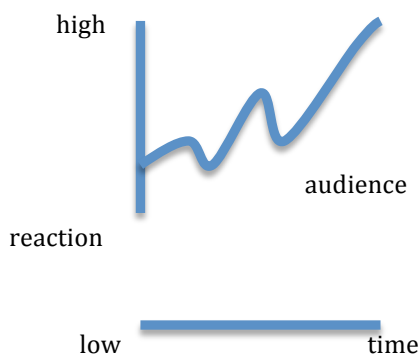
Dramatic pitches that you take the audience on – playing with the viewer

This could be applied to sound and motion

Timeline structure of film.

In a storyboard – short and long stories have essentially the same ingredients in a simple three act structure, linear narrative.

Timeline can be called be two hours or two minutes – this is broken down as:

3 act structure – basic idea – beginning, middle, end

1 quarter, 2 quarters, 1 quarter (30, 60, 30 mins) – 120 page script

Final act with false ending and all sorts etc.

Take a look at someone's **storyboard** to see if it matches to this diagram

Tent poles must be marked on this – story broken down – this is where you can put in craft and texture.

Different ways of breaking down a **story / narrative structure**

In a two minute film, if you have a story - first scene better tell the audience what its about

In film feature, minute 27 must be an **inciting incident** – exposition, tell us what is happening, create the point where the audience go Ahhhh!

In a two minute film:

First must be introduction to characters, 20 sec of what's going on, then there must be an inciting incident – eg. where is the dead body?

If you don't have a character that has a want or a need, you can't create an arc or a journey, which the character needs to go on to have a resolution

But you have to have about six things on this timeline to get texture and craft into the story

Draw this diagram, think as a storyteller and put down these points – then check the diagram against the storyboard to see what is missing and put them in.

Diagram with 8 points on it – called inciting incidents (by Robert Mc Kee, in book Story)

(informed by MA and by experience as you go)

This can be equally applied in non-narrative work – eg. in Sound and Motion, an inciting incident could be a clash of two colours! (How to apply this to non-narrative)

Adaptation, played by Cox (actor), a play by Kaufman, in the film Robert Mc Kee plays the guy on the stage who is giving out to the actors and script writers in Hollywood for using a template based on **Aristotle** – its craft, based on principles, not laws, eg.. – if you do this, you will get this

Six principles of tragedy by Aristotle

Seven archetypes – heroes

Discussion of HKs Principles Matrix

(confusing explanation – lot to take in)

3D space – KF Interview response to this list

Not convinced by depth cues

Thinks that the overall things are captured

Production methodology (moodboard, short storyboard, longer storyboard) is the exact process same as what is done in animation just assets are different

HK – **Line of action** is about motion but is also the whole thing – eg. viewpoint of the camera

Film-makers call it **Stage line -** 180 line – where camera is on that side of the line - it becomes critical in organising and designing a 3D space.

Stage line is a huge consideration in motion but also in terms of 3D space, in a 2D space you have it, but in a 3D space it multiplies itself all over the place.

HK – what about drawing a plan view of their piece

KF – use an **exercise** which goes right back to drawn animation principles of animation – *if you do, you'll feel, if you do you'll see*, for example:

If you take someone from a 2D world and transfer them into a 3D world and expect that they are going to translate the skills that they have using this technology, you're going to fail – because they would have no understanding what they are doing.

They would understand grids, floor plans and perspective from 2D world, and they understand the principles of getting a character to move, BUT, the minute you try to get them to animate a character walking off into the distance or 3/4s, or turn around and walk a few steps or handle that perspectively, it falls apart.

So, what you actually have to do is...**get them to do it**....put tape on the ground and make a huge grid (12 x 12) and get them to jump around inside it....**get people to experience it**...

Even if you were animating a 3D cube in a 3D space, if they need to take photo refs, fine, let them do it, be the cube...or if they were a bird flying, let them run around the quadrangle flapping....

In walk cycles, you don't need to know about hip rotation etc, you just have to do stupid walks up and down the corridor, until they get the understand the motion of up and down and various different...then start trying to draw it

Acting is a principle of animation....movement is more characterized by the things you put down

Your list (and others) are the tent poles of animation technique, which by the way have been discovered through process and reflection throughout the last 100 years since animation is born – to get to a point of performance.

A **principle** is not a law (more like a governing idea) – if you do this, the chances are this will happen, if you apply this, the chances are this will happen – but if you don't apply this, the chances are it will never happen

If you apply all these things – in the method of learning – then the chances are you will be able to create a realistic performance through 2D drawn, Flash or 3D that an audience will buy into, will make them laugh, cry – this is the end goal, where you want to get to.

KF going through the list – okay.

Rules can be equated to laws

HK – rules (best practice) & activators (things that distinguish it) – overall idea is a conceptual approach to principles, not based on technique alone.

KF– But the list of rules – are craft techniques – if you do this, this will happen, they are not certainties...the rules are craft based

If you do these, you will get to shades of grey, contrast etc...

Once you get the understanding of the rules and know them well, the light bulb can be anything – when you look at something and say how did they get to this?! How could someone come up with this?!

Charlie Kaufman is an example, he writes scripts that are so mental, actually is messing with proportion, he takes legitimate things and messes with them

The list of activators are the light bulbs – and the rules are the currency underneath

Eg. Kaufman writes genius scripts because he knows the currency really well and can gamble with the activators more (apply them in a mad exaggerated way, put a moustache on it!) – eg. can break the rules because he knows them so masterfully.

His sense of timing and texture has been multiplied so much that he is taking a gamble with it.

Other examples:

- Basic start is Coronation Street
- Middleground is Pulp Fiction
- Genius is Kaufman

Motion is something that moves from A to B, Timing is the texture that is applied to it.

HK – but you can't have timing without movement

KF – disagrees because you can have timing for duration, eg. a still up for 10 seconds etc?

Timing might apply itself to a 2D image – it has its borders, but timing is length, duration

Add duration underneath timing

Motion

All the principles listed here can be applied to the character and the world around it (eg. tree moving in the wind or a character dancing)

Motion is about movement – so how do you apply it to a car (motion), going up and down a hill (texture)

Editing is about motion, which is the experience we feel as the viewer

Editing is a better bed-fellow to motion than timing

Timing is a completely different thing – unless you use the term very specifically to relate to time (eg. scene 1 is 4.2 secs, it's the duration)

[HK – it's the design of timing – KF calls this the texture of timing (ingredients within something, eg, needs more **counterbalance**) – but now he agrees if Texture comes under design activators.]

KF– Editing comes under timing and timing comes under motion.

What is your understanding of an **accent** – visual/aural motif that is recurring, definite difference repeating emphasis...

KF confirm HK's list – KF is happy to meet again, wants me to send a specific part (that we didn't cover in detail this time) so we can go over it again in more detail

Follow through is something that arrives late – eg. hair, coat, but it could be the Guinness ad following the little bubble, our bodies don't stop when we stop.

The list are natural laws of motion that can be applied to narrative/representative, abstract elements.

Thinks **narrative structure** and **inciting incidents** should go under **Interactivity**

Not convinced by space cues

2D should be about organizing the single shot?

3D is about working out how you get from one shot to the other

Key points to write up

Discussion of my principles – craft techniques (rules for best practice), principles (lightbulbs), methods.

Going from 2D to a 3D world – how to teach this, method and quote

Discussion of where timing would sit in the matrix – thinks it should go under motion.

Interview Questions – Live Action Director & Motion Graphics Designer 25.06.09

HK explain background to PhD research – overview of screen design and typography – emphasis on formal visual principles.

Background experience and education/training in the field

- Can you describe your training/education (academic or experiential, or both) and how it prepared you for becoming a motion graphics designer and live action director?

- From a traditional perspective (non computer based), can you briefly describe the main aspects? (eg. what subjects, or what role(s) you worked as)

- Did your education/training include any aspects of digital media? If so, can you describe the main aspects? What have you learnt yourself?

- What are the most important skills, knowledge and aptitudes for a motion graphics designer?

- What do you consider to be the most important practical design principles governing this field?

- In terms of screen typography – are there any specific differences to print or new aspects that a prospective motion designer should know/learn?

Frome a teaching perspective:

- What do you consider to be the most important principles for students to learn?

- What are the core text-books/web resources that you would recommend?

- Can you describe the practical (and other) methods through which you teach these principles to students?

My research is focused on applying/adapting traditional (and digital) methods and principles from other screen based disciplines such as animation and film-making to the design planning, animation and editing of screen design and typography. (HK explain list of principles).

For example – **2D space** design principles would include:

- Shot types (framing, camera angles)

- Staging

- Format: screen aspect ratios – 4:3, 16:9 etc

- Rule of thirds, other surface divisions and pixel grids

- Safe areas etc

and methods such as shot lists, storyboards etc.

I have identified four key properties of screen design and typography that are different to print design and typography, they are: **3D space, Motion, Sound** and **Interactivity**.

Below is a list of some principles from animation and film-making that are particularly relevant to these properties. (HK explain list below).

3D space

- Spatial grammar for continuity (180ºrule etc)
- Camera movements and staging
- Layers (foreground, middle ground, background) and opacity
- Depth cues for deep space, flat space, limited space, ambiguous space includes: perspective, distance, focus etc.
- Lighting

Motion

- Line of action

- Squash & stretch (weight & volume)

- Anticipation / staging

- Follow-through & Overlapping Action

- Slow in / slow out

- Arcs

- Secondary Action

- Timing

- Exaggeration

- Appeal

Timing

- Frame rate / speed / duration

- Picture / sound synch

- Phrasing

- Accents

- Beat and Texture

- Counterpoint

Editing

- Narrative structure

- Continuity

- Montage

- Overall beat and texture

    (graphic, rhythmic, spatial, temporal)

Sound (Diegetic/non-diegetic)

- Synchronous (on the beat/exactly on action)

- Asynchronous (not on the beat/on action)

- Counterpoint (different/opposite)

PhD Thesis: Appendix IV: Interview Transcripts © Hilary Kenna, 2012.

- Accents (emphasis)

How would you consider the relevance of these principles in relation to designing motion?

Do you think that the above covers the most important principles from your discipline?

Can you identify any major gaps or add other aspects that may be relevant?

Here are some key books that I have found particularly relevant – can you add any books or web resources/dvds to this list that are widely used in education/training for animation and film-making and which you think are particularly relevant from a practical perspective?

<u>Booklist</u>

Animation

Blair, P., (1994), Cartoon Animation, Walter Foster Publishing Inc.

Byrne, M., (1999), Animation: the art of layout and storyboarding, Mark T. Byrne Production.

Cristiano, G. (2007), The Storyboard Design Course, Thames & Hudson.

Faber L. & Walters H., (2004), Animation Unlimited – Innovative Short Films since 1940, Laurence King Publishing , UK.

Halas J., (1987), Masters of Animation, BBC Books.

Hart, J., (1999), The art of the storyboard : storyboarding for film tv and animation, Focal Press, London.

Le Grice, M., (2001), Experimental Cinema in the Digital Age, British Film Institute, UK.

Horrocks R., (2001), Len Lye, Auckland University Press, New Zealand.

Mc Cloud, S., (1993), Understanding Comics, Harper Perennial, N.Y.

Moritz, W., (2004), Optical Poetry – The Life and Work of Oskar Fischinger, John Libbey Publishing and Indiana University Press.

Patmore, C., (2003) The Complete Animation Course – the principles, practice and techniques of successful animation, Thames and Hudson.

Russett R. & Starr C., (1976), Experimental Animation – Origins of a New Art, A DA CAPO Paperback.

Thomas F. & Johnston O., (1981), The Illusion of Life, Hyperion.

Wells, P., (1998), Understanding Animation, Routledge, London.

Williams, R., (2001), The Animator's Survival Kit, Faber and Faber.

Film-making

Barnwell J., (2008), The Fundamentals of Film Making, AVA Academia, London.

Begleiter, M., (2000), From word to image: storyboarding and the filmmaking process, Focal Press.

Block B., (2001), The Visual Story – Seeing the Structure of Film, TV and New Media, Focal Press.

Brodwell D. & Thompson K., (1993), Film Art – An Introduction, Mc Graw Hill Inc.

Eisenstein, S., (1986 paper edition), The Film Sense, Faber and Faber, London.

Katz S. D., (1991), Film Directing – Shot by Shot, Visualizing from Concept to Screen, Michael Wiese Productions.

Rees A.L., (1999), A History of Experimental Film and Video, British Film Institute.

Vineyard J., (2000), Setting up your Shots, Michael Wiese Productions.

Wees W. C., (1992), Light Moving in Time – studies in the visual aesthetics of avant-garde film, University of California Press.

Motion Graphics

Bellantoni J. & Woolman M., (2000), Moving Type – Design for Time and Space, Rotovision SA.

Bellantoni J. & Woolman M., (1999), Type in Motion – Innovations in Digital Graphics, Thames and Hudson,.

Codrington A. & Poynor R. (editor), (2004), Kyle Cooper, Monographics Series, Laurence King Publishing.

Mc Grath D., (2001), Screencraft: Editing and Post Production, Rotovision.

Reiss S. & Feineman N., (2000) Thirty frames per second: the visionary art of the music video, New York: Harry N. Abrams.

Solana G. & Boneu A., (2007), Uncredited + DVD, Published Index Books, SL.

Walters S. & Hanson M., (2004), Motion Blur: Onedotzero+ DVD, Laurence King Publishing.

Woolman M., (2004), Motion Design: Design for Motion, Sequence and Visual Impact, RotoVision.

––

Interview Feedback and Response (notes)

HK brief intro to PhD and reasons why

No books on graphic design for screen – eg. on web design, motion graphics, interactive design – specifically from perspective of graphic design

BW – reference to the documentary on Second Life (see email)

Background/Education

Diploma in Visual Communication, Dublin Institute of Technology, specialized in print.

Describes himself as a boffin – loved computers and did all his final work on computer much to the disdain of his lecturers.

How did you get from print to motion designer?

BW - always loved film, right back to Jaws, but didn't know you could study film.

Friend of sister was studying in DIT and he went up for a visit – saw a mezzotint and wanted

Also loved comic, 2000AD, gore and blood, punk.

Loved music too, album covers.

Was always interested in learning new technologies, kept up to date with the latest new things, and learnt everything he could – all software knowledge is self taught.

Then one day, he discovered After Effects – just like that – was hooked. Beta version of it, late 90's.

Was hard to get your hands on Beta versions – had to write away for them etc.

Was working in Dynamo at the time, was also learning 3D programmes by himself, then he got first lucky break.

Best friend was film maker – she was starting up film production company – and BW designed her logo, then she asked if he could make the logo move using AEv1.1 – Big Fish Productions, made it swim across the screen.

He loved motion graphics instantly and wanted to do more – also suited his perspective on design which was out there – he had done a lot of album covers, including U2 Zoorpa graphics etc.

There wasn't much motion graphics works in Dynamo and an ideological battle ensued – BW was campaigning to get more work in this area.

Several things happened at once – eg. Internet was getting faster and BW was getting access to more and more information. Also the Big Fish ident was getting lots of notice – it was like an MTV stlye animation, hip (how people described Motiongraphics).

BW was beginning to see that he was far behind the scene in US, UK didn't count except for Tomato and Why Not. Motgraph was led by US.

At the same time in Dynamo, they were designing TG4 ident – all print stuff, they didn't even have a shot at the on screen stuff at that point.

About a year went by and BW continued to dabble more and more – he did one other significant job – he did animation graphics for a presentation by IONA to NASA – really important job.

At this stage he bought a Media 100 system in Dynamo – because they were making so much money. And there was no problem justifying it, because it suited them to keep the onscreen stuff relating to the ident inhouse, otherwise they would have had to send it to Windmill Lane.

This way they had more control over the design on screen as well and it kept the whole ident design tight.

BW knew that he need to get the animations off his computer onto tape – card and break out box onto VHS.

At that stage – they offered design as service, not exclusive, just so happened that they could also make things move. Did a few more small jobs.

Then got a really big break – had done work that had become renowned for U2 – Zooropa, tour brochures, stills for screen etc. – Got hired by Mc Cann Erickson trouble shooter, Porto Rican man called CM.he wanted BW to do work for Coke...BW did print campaign images for Coke.

Then a while later, he called BW from Peurto Rico and inquired about how BW was now doing Motiongraphics – BW didn't even know the term! He wanted BW to come out to Peurto Rico and do a Coke TV commercials for Spanish speaking Central America.

Dynamo were very progressive and willing to let BW do the job. The main issues with Dynamo was they didn't understand that it took a long time to manage all the files etc.

BW was reading the Media 100 manual on the plane – didn't know the difference between NTSC and PAL. Also had no idea what the TV was going to be about. Would worry about that later – BW had a reputation of 'seat of the pants Brian', it didn't really phase him – the excitement of what you would get at the end was much more important.

Getting your hands on something is too exciting to pass up the chance.

In PR, he went to a photographers studio that happened to be a motion graphics designer as well. He was the main resource. The ads were all based on 3 music tracks – mix of colour graphics (like CH4 graphics) and mixed with live action shot on video. Colour graphics would reveal image of girly underneath. Ended up like three music videos, no narrative etc.

BW directed the piece. The photographer shot it. When they went out of the room, BW was supposed to work the magic – but was actually reading the After Effects manual when they were gone. CM didn't want anyone to know the BW wasn't technically proficient, so he kept getting him drunk. It worked and one of the ads was good – it became the mainstay of his reel for a year.

After that, BW went back to working on TG4 – which now became TnaG. Nice job – biggest lesson he learnt was that typography on screen had to be chunky, simple – they were learning as they were going along.

At that stage Dynamo was working for MTV, TV3 and TG4. It was great.

Dynamo were mainly art directing on screen graphics, they weren't doing it. Did MTV's Ireland music awards. BW didn't have enough experience, so they had to work with WindMill Lane, but he directed and Dynamo did all of the design work.

It was a brilliant learning curve – learnt suddenly about how serious WindMill Lane took the technical aspects of screen graphics eg. white balances etc. It was suddenly not funny how little BW

PhD Thesis: Appendix IV: Interview Transcripts © Hilary Kenna, 2012.

knew and he tried to absorb everything – he even bough books about broadcast graphics techniques, nothing to do with design.

BW – in that year he produced 10 pieces only because he still had to work as a print designer (his day job!), he wasn't allowed to focus solely on motion graphics.

Out of the 10 pieces, he things 5 were technically wrong – thought his kit wasn't up to it, when in actual fact, the work should have been rendered as square pixels. He used the wrong settings about a year – it looked like a pixel alignment problem. If you scaled down the pieces, there would be banding, like moiré patterns. He got away with it.

Finally – working with TG4 – they were technically brilliant and showed BW how to do it. BW got on really well with all of the graphics department in Galway, they were young and open, no egos, didn't look down on him.

In other spheres, he was really looked down on by WindMill Lane, they despised him because he was untrained and had no business working on this material. How dare he step into this territory. They were shocked, it was like a bombshell – they couldn't believe that BW was producing TV graphics on a mac. Equally BW couldn't believe how poor these expensive machines were.

It caused all kinds of problems, which continued later when he applied to join the union (more about this later). BW was constantly in trouble.

How did you get from Motiongraphics to Live Action Direction? How did he pick up formal skills in cinematography, directing,

Through TG4 – they came back to Dynamo for a new identity – print played a small part in it – they now knew how TV graphics worked – understood idents on screen, line screens, breaks, bumpers and squeezes, that logo microphone cues worked much better in a pitch than stationery to demonstrate a TV identity design. They were very agile. Also very good at producing image based work – funky, abstract.

TG4 had great respect for Dynamo – because of the trouble they had gone to, producing typography ident manuals detailing how to use the corporate typeface etc. Ad agencies completely disregarded all of this. TG4 had a rough ride with the ad agencies.

Dynamo were also internationally renowned and at the top of their game. When they would meet TG4, BW would know the studio staff (played football with them) and the management (knew them for years) – there was huge trust between them.

Came down to one meeting, one day with TG4 and an ad agency who were making small ads promoting the idea of Suil Eile – concept was to use very famous Irish inventors represented in a cool kind of way.

They were having a big meeting about everything – BW were listening to the ad agency pitch for the ad – it was very poor – it was an alkasellsor and farting sounds.

BW said that Dynamo had won the original pitch because they understood TG4 – eg. that they were an entertainment station, who just happened to speak Irish. He had said in the pitch that he saw a girl with dreadlocks in Dingle, who was speaking Irish and she was 'gorgeous'.

TG4 management asked BW after the meeting if he could do better. BW said he could.

BW went back to Dynamo and mocked up his version – got a colleague to stand between two fans, mocked up a wind tunnel with type flying over his head as it got windier and windyer.

Did graphics in AE, and edit in Media 100, and got a guy in Dynamo to do 3D wind tunnel and put blue tint over everything and put Alkaselzer box at end.

TG4 said yes – and BW had to do it – he was very worried so he went to Big Fish Productions for advice – she said don't worry, just do the creative direction and hire the other people, not to worry that they would shoot it for him. This was a crucial conversation – a turning point.

So she got him a first AD and he spent two days learning from her, what everyone's job was etc. Quickly learnt that first AD and cameraman are most important people around the director. She got him a great cameraman who taught him loads about the camera (he know lots anyway, because he was mad about photography). BW learnt everything he could.

They shot it, with a great actor and a compressed air unit (for the wind tunnel) and it worked –

It was the first time BW really got his hands on film and played around with it.

BW did all of the editing himself – it was great, layered, looked quite French and weird. BW learnt on the job – asked everyone on the job what they were doing, admits to being a geek that way. At the end, the actor's beard flew off into the wind tunnel. They were very progressive.

BW also did lo-fi motion idents before this – but he said hardly anything at the shoots, the cameraman directed, he was too nervous, didn't know what he was doing. Felt he would never do it again.

Learnt that you must go in prepared. Closes his eye and as long as he has the finished image in his mind – almost like a single key frame – then he can go into a shoot focused. Once he gets that shot, he will play around and shoot other stuff too.

Would he visualise this key frame? Yes in lots of different ways.

What are most important skils of a motion graphics designer?

BW thinks typography and composition are most important skills – need to have an eye for this the whole way through – eg. at the end of the day – these elements are all shapes and will have a

relationship with other shapes the whole way through - and you have to compose them in relation to each other, be cognizant of this.

Need to be flexible with the composition and understand it all the way - that it might change over time, there will be chaos period – but that there is a beginning and an end. In motion graphics its nearly always an opening sequence or an ad and you will nearly always end on a message.

HK not convinced by his answer – that typography and composition are sufficient for moving image sequences with sound that have to be edited etc?

How do you plan motion graphics work? Would you have a storyboard or pre visualization?

BW, mostly no, because the jobs were organic – didn't need these documents to get the jobs. He had all of the info / ideas in his head. Was a seat of the pants person through out this period.

Only if he needed to remind himself of something or a cool reference etc. The entire exposition of the work was in his head and he would work it out in the post production phase. No one else would know about it until the work was made. BW is not saying this is right, its just how he worked at this period.

HK – what is the main point of focus, driving factor that BW aims for when he makes/designs a motion graphics sequence? Was it aesthetics, beautiful images and type moving to music or was it the idea, story, narrative? Was it always about the visual or was it something else?

BW – discovery aspect of motion graphics was really appealing - found himself designing in a different way – freer, more minimalistic...

Actually, when he thinks about it, the main driver of his motion graphics design was not only the aesthetics (which were a priority) but mainly the emotional reaction of the audience.

To get this, you need a combination of elements – beautiful image/type with the write music telling a story or conveying an idea – need a combination of these to achieve a response from the audience.

BWs obsession is the idea that people can go into a darkened room – not know you, never met you – and yet can have an emotional response to the piece you have made.

This obsession goes right back to college and to Dynamo when he was doing packaging...he would imagine someone opening it going ooooh, aahh etc.

Thinks you can probably get this reaction more easily with screen work – delusionally thought that he would be famous from packaging – its an excitement, this is what drives him, excitement at that moment in time – is much more an emotional designer – has to make them feel good, look great, be cool.

So skills for a motion graphic designer – must have an idea to emote the audience – worry about how to do it later...

Actually, all jobs have limited budgets – never had the luxury to hire a production designer – tries to apply all his skills effectively – often he will avoid a creative a solution if he thinks he can't pull it off himself technically.

He will either figure out how to do it himself, buy in someone to do it or else think of another way to do it.

This also means that from a business perspective, the most important thing is managing the client who is managing the project and their expectation – never promising something that can't be delivered. BW has to take control as early as he can.

If he leaves a meeting – and knows he needs a specific resource, he will be sourcing, pricing it in the lift – he will be telling the producer that half the budget will go on this.

HK Can practical motion skills, motion principles be taught? Eg. design of motion and timing, nuances, not just keyframing etc.

Is this a technical skill that can be learnt or is it an inherent ability, like dancing?

EG. Design motion, not just moving from a to b, eg, have a sense of fluidity....

BW – doesn't think its inherent, thinks it can be taught. Yes you can teach it. It starts when you introduce people to the timeline initially, you have to get them over the fear of the timeline. May have to come back to answer this – by exploring it as we go along.

Some students will come to it naturally, they will be able to do the Monty Python movement from A to B, but will automatically put in a C.

There needs to be a point where students / designers need to unburden themselves technically. This is a big ask.

Need to know technically how to make it look smooth, to learn the technique of how to make animation look smooth.

Some people will be born with the sense, they will put in two key frames and will automatically want to know how to make it look smooth – eg. Can I make that smoother? It will naturally occur to them, they will be looking at it.

So most important skill is technical.

HK – trying to get to the difference between technically know how with regard to motion and the ability to conceive how to design motion

Analogy to dancing – can be proficient technically, know the moves, but appear wooden....

BW agrees that this is the key to really success – eg. could have 2 very good motion graphic designers that you can train, both can have really good design sensibility and be technically proficient, BUT there are a couple of things that will distinguish them...

- **a lateral thinking** – ability to combine trick A to trick Z via something new or different...creates something, its so much more technical than print design and its moving all of the time...**ability to think in lateral sense technically** this is really important

- **gut sensibility** – will be looking at footage and the music on, I will know instinctively that there is an edit there or that I could put an edit just there.

  It's the ability to watch things...to watch a piece of footage and its no longer about composition, its just an incredibly abstract thing to talk about... for example it could be a mistake, a flash frame

- **eg**. clapper board goes across the camera when the light leaks in, someone saw it on their rushes and felt in their gut that it would look good, not logical, and they stuck it in an ad, it looked great then everyone copied it...

- something BW will be watching footage (takes from what has being shot), will just see a mistake, or a little flash and it just feels right, know already that I have my timeline with my an edit there and I will just start brining it over, its magnetic and I know before I even pop it in –

- that if I pop it into the timeline, the timing might be wrong, but I can do something technically to adjust it and then BANG, CLICK, it will be right, I just know it, it's a feeling. I can not describe it.

- If you can imagine all the two things, your design skills, this lateral thinking in terms of your technical skills, when you have shot all your bits, have got everything and then it all comes together... and hopefully you have something cool...

Has anything you have ever done turned out completely differently to how you imagined, conceived it? You do everything the way you imagined but it changes in the <u>editing process</u>...

BW gave example of a Spar ad, which was a rites of passage ad (500k ad), and there were certain choices and things that happened that were not his choices...someone else was editing it

Go back to editing – how do you work with the sound in relation to the image?
Do you have the sound before you do the shoot, do you have a track in mind?
Do you edit the sequence and put the sound down afterwards?
Do you have the sound and break it down, pick up the beats and edit to the sound?

BW – every project is different, could be all these different ways.

It depends on the project – eg. piece for Wolfram was holistic, wanted you to feel something overall – so music has to be completely linked to the visuals and if you look into it, you will notice there are layers and layers of things happening and clicking, on offbeat's and everything.

Did you listen to the music as you were designing it, and work it out beforehand, or did you do the synching as you were editing it?

I listened to the music and instinctively knew it would be lovely to edit to.

I knew from the start that there were fundamental blocks that I wanted to do, that would work and if I animated them in a specific kind of way that I could easily add in a lot of extra stuff, give a wide degree of flexibility

This type of job is like oil painting – do your initial sketch to the basic music – I had the music from the beginning

I knew from early on that the product was something different – big 100ft, 30ft screens, organic and weird and that he wanted something different, felt beautiful

I also thought that they would expect colour and a stonking rock track, so deliberately I went for something else, monotone and classical music, and something strange

I knew that this would stand out and be different in a presentation pitch – I played the classical track at the pitch and they loved it.

How do you insist that students look at sound early on, they think about visuals not sound – that it must be considered from the word go?

Role of sound is huge. Earliest influence was Erasure Head, best use of sound ever in a film.

Must think about sound and visuals from the word go.

Must consider it from the beginning, both image and sound together….especially when you are working with ad agencies…where you may not have control. Has worked with composers with mixed success.

I would have a number of like tracks, samples that I would use that I would demo to the composter..

I can not over state enough the importance of sound.

Do you now think that other aspects are more important for motion designers, not you intitial response…typography and composition.

BW agrees.

BW reaction to HK's Principles List

Looks at principles – doesn't know them formally but can interpret them...seems okay.

Now going back to design of motion – key framing....what would you do, teach them, how?

BW – First thing he would do, is find out what they like, what rocks their boat?

Would try to make it relevant to what they like.

HK explains sound and motion project – and ideas behind it.

Take a different example – student A's project – how to teach her, explain to her how that could be done with photos only.

How can you teach students to <u>conceive impossible spaces (2D-3D worlds)</u> where you move the camera around it? Not traditional line of action, panning and zooming through space...

How would you get students to understand 3D space and storyboard, plan it out before they go on to the computer?

2D-3D has become a term

Where has this trend come about, why has is come about? Digital Kitchen, trends, technology has evolved, how ideas have evolved. Some of this work is so complex that they have whole R&D teams behind you, testing and working it out.

Now however, its all moving back to simple images – all the cool studios, the leaders, those doing really cool stuff are going back to this.

For instance there is a whole new generation of storyboard artist – who are qualified designers, brilliant in Photoshop and Illustrator, technically excellent, they have a great understanding of camera moves and so on, particularly in AE.

This all they do, I hire them in to conceptualise my work – they work out the key shots you need, the camera moves etc, they get that fluidity down and it becomes a blueprint.

The only successful way to understand this 2D 3D world, to get clever camera moves etc – and it's a big understanding to grasp two big worlds colliding 2D and 3D worlds –

Ability to understand a 3D world, but have to do it in a 2D way

Ability over time

And a good design sense as well

Its very demanding area, it's a lot to grasp

How do you understand the camera moves and how to set that up?

Print out stuff in flats and stick them to a box – say here is your first wall....

Bottom line, not everyone can get 3D, it's a spatial relations issue, think they should be tested to see if they have the facility for this (eg. spatial relations).

The art of the clever camera move has moved on – however, we will see it again in the future but in a much clever way.

Still haven't seen better typography than Radio Scotland ads – even better than the camera move jobs –

Has analysed these works by going through them frame by frame to see where they have changed axis etc. – sometimes haven't a clues how they did it – but know that my eye seems to like it.

Sometimes these works come about because the person making it has made a mistake and then decided to leave it in, because it looks cool. And the foolish audience like me is trying to work out how they did it....

Translates differently with abstracts elements

Intro to 3D world via AE is very poor, the interface is not intuitive and if this an introduction for students then its really hard – has to be worked out on paper perfectly beforehand....

Last question is about timing, can you teach it?

Yes, probably easier than 3D.

Lots of guiding principles....for example:

Start off and deconstruct a 30 second ad, from structural perspective, not even – eg. end frame with logo/message has to be 3 secs at least, how long it takes for important information to be read, and the type size has to be big enough etc.

Once you break a sequence down, it makes it much easier to understand for someone who doesn't have an inate sense of timing....they begin to get a sense of the main components of the time space.

What about timing the movement to the sound? Do you think it's a manual thing, learning using markers etc?

Remembers teaching timing, got a student to open up the timeline and hit the star key to mark out the beats. Then I got her to put a box all the way along the timeline and put it on and off in relation to the beats.

After that did she begin to tweak the curves etc.. this is where it gets tricky..

Can you teach unusual timing – eg. against the beat etc?

Yes, you can teach fundamentals, then challenge them.

Have you ever heard of texture in relation to timing?

No, please explain it.

(HK, probably better if you think of it as not being symmetrical...

Play a piece of music, show them a box moving to the beat, then at different speeds, then a combined one...

Analogy of rubbing tummy and patting head at the same time – playing the piano, but have to get the two hands working together....

BW thinks that in motion graphics you have to all the plates spinning....

Also thinks that you have to be really anal at every level with files, file naming and that you should take your time and be very deliberate.

Final question about typography for screen...what are your key tips

Big or chunky.

Colour, safe and safe areas

3 seconds for T&Cs

What about letter spacing – more generous...

Did a Radio Scotland thing for TV3, interviewed people on the street that was only type based.

Do you think there is a future for word based motion graphics?

Yes, think in terms of the ad break – reality of trying to sell a product, audience wants to have a good time. What is going to make the ad stand out – always think typographically because its so rare...

Enjoyable conversation – because you don't get to talk about this type of thing, geeky stuff.

What do you think of Emil Ruder? Left of field typography book – look at it from an ideological perspective, thematic based, raise awareness, get students to see it for themselves.

BW thinks all of the final year students were quite self aware by the end of the year, they could look at their own stuff.

Thinks what is unusual how the market has worked, about the market of motion graphics is how it has evolved. For example, how much control still the motion graphics studios have over the client is very unusual. So therefore you are seeing wild abandon, self-indulgent work.

(HK – is it because people expect, need to see something startling on screen?)

BW – thinks the problem is, you look at work and you think technically its amazing, the work is visually stunning, how did they do it? I can't even figure it out and I know how to do this stuff. However, you watch it and you feel nothing at the end of it.

And that's been my big problems, but would like to feel something – the race to use the next gadget.

BW – look at Brand New School – how to get the arrow to go around the corner – BW only figured out how to do years later. Also thinks it was sociological, thinks people were willing to buy into it, the wilder, crazier the better – pushing the technology to its limit all the time....

Now, its no longer a case of looking at the work and thinks how gorgeous it is, beautiful or love it, but it more about how did they do it, its great.

Now its come home to Ireland. So much so, 5 years later, Tile Style want their arrows going round the corner. Now companies are coming in here and ad agencies love it.

Ultimately what led these companies to do these extraordinary things in the first place was:

Good design sensibility, thirst for knowledge, thirst for new things...but no breaks on writing a script.

What about Chris Cunningham – Apex twin, and Bjork video based on George Lucas' film THX?

Is motion graphics stuff only effects driven messages rather than concept/idea/narrative driven?

Yes, script is all important. Director, film-maker, storyteller in the driving seat.

Thinks its Microsoft's fault, because there were certain breakthrough ads, because the technology became available...people like me could do it...available to designers (mac based), designers could make their graphics moves.

All designers need to be technically proficient, and they got to like it.

Do you think that script writing / narrative and story structure would be critical to an MA in Motion Graphics.

Even with all this, with our eyes being overcooked etc, you will still see even better work, you will see something that will make you go oooh.

Overall, I still think that the standard of motion graphics has improved, TV in America...is much better

NBC logo – with petal moving by Capacity.

Thinks where work is most interesting is where things cross over – BW is always interested in the single image, the iconic image, that is unusual…

Eg. Next pitch is for Dublin Film Festival – shot a thousand shots of images along Dublin coast – is planning to stitch them together – will use about 30 images….feed them through to try to make one long take

Discussion of Flickr – new technology enriching the world

Idea – how many times have you appeared in other people's photographs? Could it plug into Facebook? Everyone loves stickers…find out how to do it and get funding….

Reference TED talks

Really interested in technology – even in my little area – motion graphics – I am working in a 3D programme used by a small number of people – he found a Yugoslavian programmer who designed a plug in called 'Roll It' and it worked.

Ultimately, BW wants to be a film-maker wants to make a film – is writing scripts. Developing scripts all the time, is applying for Frameworks money. Wants to make a horror, Japanese, thinking man's gore.

Is a designer and a pragmatist and loves new technologies – sometime you should just take the money and run, can still well craft and project and give the client what they want. Finds this level of anal designer control too claustrophobic.

Culture of being a motion graphics designer means he was having more fun – you can't have fun if you are being a serious print designer….

Dynamo was like a rock band that split up – made some great albums…

He feels that this strict approach can quash creativity and creative exploration….be freer, relax and let go…take risks…

BW wants to start up a Digital Kitchen here, but it isn't viable yet, not enough work here.

Doesn't have much interaction with animation companies, because they don't have any sense of design – and are unwilling to engage with the poor script from ad agencies…

These terrible scripts will go to Psyops in New York, etc. Only very occasionally, you will get a good script with some good visual references, usually written by a South African and it may be typeset nicely.

Pitching is free – but you do get paid per day, well paid per day as a director. Agencies looking to get costs down. Motion graphics is totally different, charge anything, used to give breakdown, now don't just state – design, sound, post-production etc.

Interview Questions – Principal Creative Director/Graphic Design & Typography 19.10.09

[HK explain background to PhD research]

Part A – Your experience and viewpoint

Background experience and education/training in the field

- Can you describe your training/education (academic or experiential, or both) and how it prepared you for becoming a graphic designer?

- From a traditional perspective (non computer based), can you briefly describe the main aspects?
  (eg. what subjects, or what role(s) you worked as)

- How did your particular interest and expertise in typography come about?

- Did your education/training include any aspects of digital media? If so, can you describe the main aspects? Or what and how have you learnt yourself?

- What circumstances lead to the extension of your practice into motion graphics? How did you acquire the skills to work in this area? How did your existing expertise apply to this area?

- How would you describe your engagement with the field of web design? How does your existing expertise apply to this area? Have you found it necessary to acquire new skills?

General consideration of skills in the field

- What do you consider are the most important skills, knowledge and aptitudes for a graphic designer?

- What do you consider to be the most important practical design principles governing the field?

- In terms of screen typography – are there any specific differences to print or new aspects that a designer should know and learn (for motion or web)?

From a teaching perspective (or from mentoring junior designers in your studio)

- What do you consider to be the most important principles for students to learn?

- What are the core text-books/web resources that you would recommend?

- Can you describe what practical methods you would use to teach these principles to students?

Part B – Your response to my research

My research incorporates applying and adapting traditional (and digital) methods and principles from other screen based disciplines; such as animation, film-making, web design, motion graphics and human computer interaction; to the design planning, animation, editing, prototyping and programming of screen design and typography.

During the course of the research, I have identified four key properties of screen design and typography that are different to print, they are: **3D space, Motion, Sound** and **Interactivity**.

The following diagrams illustrate Emil Ruder's practice methodology and a draft practice matrix for screen typography, which has evolved from them.

[HK to explain diagrams]

Discussion and critical feedback on the following aspects of the diagrams in relation to screen typography:

- Role of Design Basics
- Properties of Typography
- Design Principles for Typography

Interview Response/Feeback (Transcript) – 19.10.09

HK explanation of PhD research

Background – in my own work and teaching – problems of using typography on screen, applying design principles to screen typography, and using them in my own work.

Literature review led me to Ruder

Practice review led me to modernist work, including Spin's work.

Explanation of how I have extracted a practice methodology from Ruder to create a method for screen.

Outcome will be a website with samples demonstrating the application of the method on screen.

Explanation of methods – eg Ruder.

Part A

Your training and education in typography

Was taught traditional typography from a guy who was using the 50s method – eg. tracing typography, Helvetica. I had a natural leaning towards clarity, think typography should be legible. It was rigorous.

After Halifax (2 years), joined Sommerset (2 years) where there was almost no training in typography. My interest in typography and organising typography was auto didactic – began post college.

Interest was sparked from working with metal type, working with the little units of type. Loves the ideas of units making up a bigger picture.

I started wanting to do illustration because I could draw well, seemed it could be a valuable skill, count for something, like Muller Brockman was a great draugthsman. I also got interested in photography and image-making. I went to Sommerset because I wanted to do illustration, but soon decided that I wanted to be a graphic designer – to mix image and type.

There were no computers in Sommerset – only a Bertold when I was leaving.

I was only allowed to use two typefaces in Sommerset – Futura and Garamond. They didn't want us worrying about what typefaces to choose but to focus on how to use them. I didn't like either of them and so everything ended up looking a bit twee...and the combination of the two doesn't seem to work either so it seemed strange.

But now, we choose typefaces either conceptually or aesthetically, it was like living in austerity times, so we went a bit wild.

Think its it interesting what you said about people using Helvetica and not understanding the underlying structures whereas at Spin, we are not using Helvetica, but we are looking and using the underlying structures.

HK – What about your engagement with computers? Are you self-taught?

Only got to use a computer in my second job – I got an hours training – and the thing that really got me was that I could stretch type, which is really horrendous. But we were all incredibly excited by this for about a week.

It was obvious to me that computers were going to be the future and it was obvious that I was going to have to deal with it, and my eyes are very sensitive to the screen...I've always seen, almost as an act of will, see the computer screen as a print designer.

HK – What do you mean by that?

The screen has the potential for structure in the same was as a piece of paper. Not necessarily in a 2D way. The screen has the potential for structure that can be larger than the surface area – it was the first this I did, got excited by – the fact that the screen could be larger than the surface area that you actually saw.

And that it has a z axis, which is very exciting – a big part of me wanted to get into websites and screen design – because they were so ugly at the time. In fact, designers who technically savvy, but who weren't good enough to get a job in print were getting jobs in screen design and they made up their own nerdy little world. I hated this and it offended me that there was a technical barrier.

Eventhough I didn't have the technical skills, I was damned if I was going get in there some way. I can't print things but I can talk to a printer, so I was determined to get into this – and we actually got in through cdroms – that's how we got into motion graphics and websites.

Will I tell you how I got into motion graphics and cdrom ?

First thing we did was an exploratory thing about Spin – exploring the word spin, it was interactive, it had several parts, - it had a radio part, an interactive part – we were all making Director movies – and one guy in the studio who was brilliant in Director, David Rainhart, put it all together. But we all had to learn this stuff.

We showed it to Creative Review and they put it on their disc, we were really surprised – it was interesting to do at the time, but now it would be embarrassing now, I've no idea where it is...

From doing that, Diesel saw it and asked us to do a cdrom for 55DSL, which was the first piece to win a DNAD pencil for digital media. Still we hadn't worked it out, we were going through a phase of searching for a voice...there were a few people doing organising stuff and what have you...

So I made a decision that I didn't want to do this, and I had to lose a few people. My heart wasn't in it, I said, this isn't me, this isn't the way I want to go, it was very instinctive, it wasn't from a position of saying I have an Emil Ruder vision. It was a real gut thing...I just wasn't happy...

I was looking for something more structured, more minimal. The way I come at **modernism** is through punk more than through Emil Ruder. It was through Malcom Garret and Peter Saville, and all that...at college we weren't thought about Muller Brockman or Wim Crouwel or anyone like that....

All I know is that I saw an early piece by Gert Dunbar, that wasn't over the top, it was quite refined and it made me melt completely, not the crazy stuff he did later.

And so people seem to have that innate need, desire for certain kind of approaches...and they gravitate towards them...

I didn't want to follow the zeitgeist...I wasn't happy with it, I wanted something with clarity and more powerful thinking – which is what I had always associated with the certain punk things that I liked, the ideas were really strong, articulated with really individual voices, rather than just visual soup.

How did the very clear voice in print extend into screen? It seems so fluid...the pared back sensibility...

Nobody put graphic design on screen. I kept watching these God awful things on BBC, horrible 3D rendered stuff by people who know how to press the buttons, use all the different sparks they used...just because you can...that's not thoughtful, that's not beautiful...

PhD Thesis: Appendix IV: Interview Transcripts © Hilary Kenna, 2012.

Bringing graphic design on screen, bring design sensibility on screen....and making them move...was the most exciting thing....absolutely amazing thing to do and I still haven't tired of it.

In fact we have just done something recently which is really good....hard back graphic...

We did it ourselves, a big part of it was the limitations we had...we drew pictures of things....like the CH4 things...we made a movie...

We made a piece of interactive work and that got us interactive work, then we made a piece of motion graphics and that got us motion graphics work.

We made our own little thing and that got us work...after effects wasn't around, we made it in director...so CH4 asked us to pitch to them....

We couldn't present, make what we wanted to show them so we made a big long strip of the images and the way the graphics work together and got a piece of card and cut a hole in it and moved it along and explained it to them verbally....so we then went into a production house....it was our first time

So they couldn't make it...they couldn't make the mattes, you know this multiply affect...they couldn't do it, it kept looking milky, and after about a year of trying to do it, finally After Effects came along and we ended up making it ourselves....

So that's how, but the exploration of making a piece of typography move, a whole world becomes available to you – of transition, and timing, and story telling which is just absolutely fantastic....but it can be like driving a runaway train so you have to be in control of it...

The more control you have of it, the more refinement it has, the more beautiful it becomes, the less obvious it is...

Tell me about the process...do you do it yourselves, in-house...

What I realised on the interactive side and on the motion side – design is now more collaborative that it was in the 50s, 60s, or even when I started, you could just make something...

But now you can't be expected to have all of the technical capabilities at your fingertips.... because as soon as you choose one, you are limited by that one because another one comes along and wipes that one out.

We used to employ programmers...and specific web designers...but now what we do, I employ designers, any contemporary designers will know about, how to design web to a degree and motion...

But I always get specialists in, we work with, collaborate with other people, either get someone in or go production house that we use, that understand us well, and we bring in our sketches and our rough bits and pieces in...and then we work with them to get to where we want...

But we have a very clear vision so we know we are not being run by the machines or by them.

Is is difficult – the collaborative process?

We use the same people, who know Spin, who we have a good relationship...they know the nuances we are looking for...

It can be utterly soulless putting flat graphics on screen so you've got to make it have nuance so it lives, so that detail is very difficult to get.

How do you communicate that detail?

We do it verbally, we try and make bits, we move bits around....I remember when we were working on Dispatches – which has a story unravelling like a t-shirt...we look at knitting....so we figured out how unravelling actually happens as opposed to how we thought it would work on the machine...

We make quite a lot of noises...do it like this, like that etc...there's quite a bit of acting involved.

What are the things/nuances (from your own expertise) that you think that make something good on screen?

Same things that make things good off screen....its very hard to keep your sensibility when you go onto screen....something strange happens, designers often lose their sensibility, you have to try really hard to keep your sensibility on screen....

They somehow enter a world of different possibilities....because it like looking at an endless sea of not a screen, possibilities...its overwhelming.... its like a vast plane....

But as soon as you put structure into its, as soon as you put a grid into it, as soon as start to organise it....it starts to...you need a fundamental base....and ours is the same on screen as it is in print...you need structure...

But then why is that so many print designers can't design screen based work – its static and stilted and fixed? Because they might have a structure on the page...but can't do it...

It's a good question, because they need to get lost first, we got lost...I'm talking from a position of knowledge and experience, when I got well and truly lost...

Then you start to understand the possibilities, of start to see where you need solidity and flexibility....a combination of solid structure and flexibility...a fine balance...it is different....

Like dancing...can do the steps but looks mechanical...

You have to embrace the fact that screen design can be slippy, have to embrace the fact you could fall over on your arse, its more like ice-skating....

HK – Do you have a top five no no's of things that you shouldn't do on screen? What are the key considerations?

You need to make mistakes then you don't do it again....

You have to have an idea – always start from an idea – if you are working in motion graphics, your ideas are probably in a certain area – put things on the wall – will always look at it as a flat object, as an idea first, look at it objectively, in a flat way and then see what imaginig where it can go, what possiblities it may have....

Is the idea engaging, is it appropriate....all the same check list for a print job or websites

But the wonderful about motion – is once you've got a strong idea – the world is opened up, you can do so much with it....its wonderful...

Like the MTV things...once you've got an idea of minimal movement suggesting maximum image...you know you can do so much with it...that's really exciting....you can go on and on and on and on...you know we made loads of them, all different sorts....

You've got that one thing that is so precise and narrow down, the quality of the idea is the only reason anything is any good ever....

Getting to the quality of the idea means you can't really fail after that....that's why you can do little doodles and animate them and they can be so beautiful...

After coming up with the idea, its trying to make to make it move in a beautifully, human and elegant way, after its been given its feel, its look and feel...

For instance on the Channel 4, the idea was a river of ideas, it looked like a river with flat plates of graphics....and the little nuances in the movement is when they flow across, whether anyone knows its it's a river or not, it's the inspiration for the way the graphics move....it gives it an ineviablity that makes it look right...

Our website, the way the type moves...

Graphic structure, simple grid, make it move elegantly...

Hi-res did the animation on our website, we chose them specifically – we acted out how we wanted to the type to move, they had so little to work with...types moves off, pace it moves, slows down and moves bacck, that's what makes it look elegant and gorgeous.... etc...thats what makes it elegant, I have seen people rip it off in the last few months...but they can't get the nuance of movement...

PhD Thesis: Appendix IV: Interview Transcripts © Hilary Kenna, 2012.

HK explains that all of these qualities are classical animation principles...like slow-in, slow-out...

I am amazed, I didn't know this...we call it ramping...ramping down in and ramping out again, cant start quick, has to ramp up quickly, then slow down...

It works...feeling of being touched, that responsiveness, on a website is starting to feel mechanical...

There are ways of turning over the pages of a book can feel beautiful, and there are ways that can feel dismissive and there ways of responding that feel lovely and there are ways that feel mean!

Human, naturalistic, beautiful, achieved with minimal means....its very hard to do...when you do its amazing.

You clearly love motion, do you find web frustrating?

I love motion graphics, I want to do film titles...

The limitations are getting better...like we just did a Wordpress site for Unit, it was like doing a one colour job. It was fun to do.

I like the idea that website could start off as ugly ducklings and now that they can be beautiful and are worth saving, there should be a museum somewhere to save them.

The assumption that print designers are also good on screen is not true in reality?

I am making an assumption, I am forgetting all the horrible stuff we did at the start and what we learnt from our mistakes....I know how badly it can go wrong...

I like the magical quality of moving...its magic...of telling a story...

I get the same heightened sensibility when I feel a piece of paper...as when I watch a beautiful piece of animation on screen....there's a whole world going on inside it...

Its really difficult to get something good.

We do storyboards...and use lots of annotation…

Do you think students need a rigorous basis in typography first before working on screen?

Yes, they need to know, understand what they are breaking and need to be excited about what they are breaking. It's difficult for students to love typography. The sooner they can, the better for them when they work on screen – if they love the arrangement of it, the layout of it, the design of it, the forms of the letter...from the bottom to the top, if they love it and can get it, they are off and running..

The best ones are the ones that get it early.

Because they are so familiar with it, they can't see it, they don't think they're seeing anything. They can't see the potential of it, they read books, newspapers, what am I looking at here, they don't even see it as design, its bizarre.

Thing is they are going to be working with it every day – but they still can't see it.

Doesn't blame them for it, that's just the way it is.

Part B – HK's research and practice methodology.

HK explains diagrams.

I think its scary, likes seeing my life (not classical music).

I see motion as being like poetry, and I'm really into poetry.

The problem is, you can't get someone back in the box once you've let them out. You can't start them out on the screen.

You can't use a typeface unless you understand the cultural context of a typeface.

Asymmetry is key.

This is totally singing with me.

Thinks 'properties' is a good name, it makes sense.

Really reminds me of my presentation at AGI – when I crashed all the type together – the incorrect kerning were supposed to be decorative but they were actually readable...

That's a great thing to do (Sound and Motion project).

That's really nice – (formula for practice).

There's a new book here! There's a real gap for this.

Fantastic! (about the list of rules that I've written)

Line-length is really important – people don't read.

Questions about some of the animation principles – follow-up action, secondary action, exaggeration, appeal...may/may not be relevant – clarify...

Timing – interesting thing about that is that you automatically make things match the sound – its instinctive.

Difficulty with editors – because we don't see things in the same way – whether its through doing books, doing graphic design we look at things in a different way – they do things too straightforward. I'm listening to a different rhythm, they have no discordance...

Sound is so difficult...it makes 50% of the thing you are looking at...its such as skill....

Interactivity....

What do you think about the default aesthetic on the web? Its everywhere – they think its pure and untouched and usable – but it's the same thing, the same conversation over and over again....

Assumes that everyone likes the same thing...

Fabulous. Its fantastic. Really, I can't wait to see it. I've learned so much from this, I've been learning by bumping into wall and you get a headache.

Timing is the secret of good comedy. Timing on a website is not the same as in an animation – because timing is often the choice of the when the user wants to use the next bit of the website. The potential for that next event has to be there but you can't dictate when it going to happen. You can't tell when the page is going to be view or if it will even be viewed. That is timing, but its very different.

If its text only, but if its text and images (eg. what if you have 30 images in that one spot on the page), there are almost temporal decisions within a single page.

There is timing in terms of how much time you require someone to look at a page. Take magazine design – three different readers – ones that read headline and picture, ones that read headline, picture and secondary text, and then there are readers who read headline, picture, secondary and tertiary (full article).

So should websites be designed like this?

I'm interested in this because we are redesigning our website – because our website could be a disaster if people only go along the surface.

I thought that our approach to typography in motion –

This is everything, all at once...everything in one layer – anything you're interested can be found in two layers....but you have to scroll down.

Thinks that Spin's site should show all the images at once in case users only look at one image...

Also thinks its not good for presenting – finds it difficult to talk about the work over this format...

Reward the user for clicking once – reward should be quite high....its also, if you like this, you will also like these....showing more of the project that the user has chosen and other projects just like it....means that there is more of a dialogue with the audience...

Don't want the audience to stop there – because otherwise its too limited...

I really like this – there is a great big gaping hole for this – its really scary that it hasn't been dealt with...

Archiving is a big issue...because everything we make is rotting...cyquests, disks, dvds etc...

Thank you, I enjoyed that. That's great – I love it. Come and talk to us about it.

This is a starting point. This is not about Emil Ruder, it's a very good way into this subject...its a launching pad...

Very good, very interesting.

Appendix V:
Diagrams in development sequence

The range of diagrams presented earlier in this thesis is set out in relation to the structure of the text argument. This appendix presents them in the sequence of their evolution, showing how they developed through an iterative process that critically compared, contrasted and combined different strands of enquiry within the research.

For example, research into the properties of screen media (chapter 2), coupled with the review of contemporary practice in screen typography (chapter 4) combined with the list of properties and principles from the literature review of typographic knowledge (chapter 3) and the practice matrix diagrams (chapter 6 & 7) will be shown to mutually inform each other's development. This appendix is an effort to further demonstrate the non-linear and multi-faceted nature of this research and the process through which it evolved and developed.

Extended captions have been added to further elucidate how the development of each diagram informed the next and so forth.

Screen Typology

classic
screen

dynamic
screen

real-time
screen

augmented space
screen

Figure 2.2 Screen Typology showing overview of different types of screens. This diagram evolved from reading a number of texts relating to the definition of what constitutes a 'screen' (Bolter,2003, Mannovich 2001, Friedberg 2006, Gere 2006, Mod 2011) and the need to develop a typology that presented the main stages of development but which did not reference specific technology.

Screen Technology

CRT (Cathode Ray Tube) is a vacuum tube in which electrons emitted from an electrode are focused onto a phosphorescent screen. The electrons are aimed so as to create an image on the screen.

Font rasterization is the process of converting text from a vector description (as found in scalable fonts such as TrueType fonts) to a raster or bitmap description. This often involves some anti-aliasing on screen text to make it smoother and easier to read. It may also involve "hinting", that is, the use of information pre-computed for a particular font size.

Anti-aliasing techniques from computer graphics are used to determine how much of each pixel is occupied by the letter, and then to draw that pixel with that degree of opacity. Edge of letterform rendered using opacity % value of letter colour against background colour.

Sub-pixel rendering is a way to increase the apparent resolution of a computer's liquid crystal display (LCD) or Organic Light Emitting Diode display by rendering pixels to take into account the screen type's physical properties. It takes advantage of the fact that each pixel on a colour LCD is actually composed of individual red, green, and blue or other color subpixels to anti-alias text with greater detail or to increase the resolution of all image types on layouts which are specifically designed to be compatible with subpixel rendering.

Examples: *Microsoft ClearType (2006), Apple Quartz (2007), Adobe CoolType (2000).*

TFT-LCD (Thin film transistor liquid crystal display) is a variant of liquid crystal display (LCD) which uses thin-film transistor (TFT) technology to improve image quality (e.g., addressability, contrast).

IPS (In-Plane Swithcing) was developed by Hitachi Ltd. in 1996 to improve on the poor viewing angle and the poor color reproduction. Its name comes from the main difference from twisted nematic (TN) panels, that the crystal molecules move parallel to the panel plane instead of perpendicular to it.

classic screen   **dynamic** screen   **real-time** screen   augmented space screen

LED (Light Emitting Diode) based 7-segment display showing the 16 hex digits

Monochrome pixel display Reflective STN LCD

− black   + white   + − subcapsule (hi-res)

E-ink (Electronic ink) is made up of millions of tiny microcapsules, about the diameter of a human hair. Each microcapsule contains positively charged white particles and negatively charged black particles suspended in a clear fluid. When a positive or negative electric field is applied, corresponding particles move to the top of the microcapsule where they become visible to the user. This makes the surface appear white or black at that spot.

Figure 2.3 Overview of screen technology. This diagram presents only the briefest technical overview illustrated visually, in an effort to capture how typography is and has been rendered on screen.

Screen Resolution

PC
(c 1981)
320 x 200 px,
72ppi CGA
(IBM 5150 PC)

**Multimedia PC +
Internet Access**
(c. 1993)
640 x 480 px
72ppi VGA
4:3 aspect ratio

Mobile Phone
(1997)
84 × 48 px monochrome
(Nokia 6110)

Flat-Screen
(2009)
1920 x 1020 px
(42 inches)
16:9 widescreen aspect ratio
TFT-LCD/Plasma

Rollable Displays
(2010)
432 x 240 px (121 ppi)
4.1 inches
(Sony's rollable OTFT OLED display)

classic
screen

dynamic
screen

real-time
screen

augmented space
screen

Digital Watch
(c 1975)
LED-based
7-segment display
showing the 16 hex
digits

Handheld Games Console
(1989)
160 × 144 px
66 mm/2.6 in diagonal
Reflective STN LCD
(Nintendo Gameboy)

Smart Phone
(2007)
320 × 480 px (163 ppi)
(iPhone 1)

(2011)
640 × 960 (326 ppi)
3.5 inches/ 89 mm in diagonal
1.5:1 aspect ratio widescreen
LED backlit IPS TFT LCD
Retina display
(iPhone 4s)

Laptop
(c. 2000)
1600 × 1200 px
32 bpp SXGA+ TFT LCD,
(Dell Latitude C800

Tablet
(2010)
1024 × 768 px (132 ppi)
4:3 aspect ratio 9.7 inches / 250 mm in diagonal
XGA, LED-backlit IPS LCD
(iPad 1)

(2012)
2,048 × 1,536 px (264 ppi)
9.7 inches (250 mm)
color IPS LCD display with a 4:3 aspect ratio
(iPad 3)

Resolution
number of pixels wide by
number of pixels high

Aspect Ratio
4 : 3

Aspect Ratio
16 : 9

PPI (pixels per inch)
pixel density per square inch of the
display

Figure 2.4 Overview of screen resolution. The exercise of charting the main developments in screen resolution underlines the seesaw progress of quality (resolution) versus size of screen. This diagram helped to clarify the virtual/physical attributes of the screen which are detailed further in Figure 2.6 and the difficulty presented by the fluid format of the screen for the consistent design and composition of typography across multiple screen devices, a phenomenon now well known as 'responsive design' (Marcotte, 2010).

Screen Usage

| classic screen | dynamic screen | real-time screen | augmented space screen |

Screen	*Cinema Screen*	*Television*	*Desktop Computer*	*Computer, Laptop, Smart Phone, Tablet*
Usage	**Entertainment**	**Entertainment**	**Productivity*, Entertainment**	**Communication*, Productivity*, Entertainment, Education,**
Activity	Viewing, listening	Viewing, listening	Viewing, listening, reading, typing, clicking	Viewing, listening, reading, typing, clicking, speaking, touching
Context	Public	Private	Public / Private	Public / Private
	Social	Social	Individual	Individual/Social

Communication* email, instant messaging, voice and video phonecalls and conferences
Productivity* searching, writing, creating, editing, publishing etc.

Figure 2.5 Overview of screen usage and audience/user activity. This diagram further informed the development of screen properties connectivity and interactivity that are presented in Figure 2.6.
By presenting an overview of use case scenarios with screen types, it helped to clarify areas of typography practice within the environment of the screen which evolved into the Practice Map (Figure 2.7).

Property	Description
Multi-media	text, image, sound, animation, video, voice
RGB	light reflective colour (red, green, blue)
3D	virtual 3D (x, y, z axes)
Time-based	users control the time spent accessing screen content, this content may be static or dynamic (motion based) or live (updated and changing in real-time)
Variable Size/format	variable sizes and resolutions from – large and fixed to small and mobile mostly landscape orientation (with the exception of smart phone & tablet)
Connectivity	to other screens/users and internet access
Interactivity	
Devices	mouse, keyboard, touch pad/screen, stylus, microphone, camera, remote control (joystick, console control, pointer)
Actions	cut, copy, paste, select, edit, type, save, delete, draw, scroll, click, drag, tap, swipe, pinch & zoom etc.
Activity	read, watch, listen, speak, play, communicate, search, browse, scan, learn, interact (explore)

Table 2.1 List of screen properties. The list of properties in this table were drawn from diagrams Figure 2.2-2.5 and subsequently developed into the diagram below (Figure 2.6).

PhD Thesis: Appendix V: Diagrams in development sequence © Hilary Kenna, 2012.

Screen Properties

Multimedia

text, image, audio, video, animation,
(3D, motion, time, sound

Connectivity

mobile, ubiquitous,
dialogue & social network

Interactivity

type, click, write, touch, speak, point,
look, move/gesture

Virtual/Phyical

RGB light reflected, fluid size, focal points
infinite canvas, 2.5D & 3D layers, z-axis

Figure 2.6 Overview of screen properties. This diagram was developed from a distillation of all the previous diagrams and research in an effort to define the underlying properties of the screen without referencing specific technologies. Once these generic screen properties were developed, it was possible to overlay these against contemporary typography practice as part of the evaluation criteria to qualify work that represented screen typography. This led to the populated *Practice Map* (Figure 4.1) presented in Chapter 4. These properties were also incorporated into criteria for assessing contemporary work (see Chapter 4, p.158) and therefore made a significant contribution to developing the diagram *Properties of Screen Typography* (Figure 4.119).

Practice Map
Screen Typography
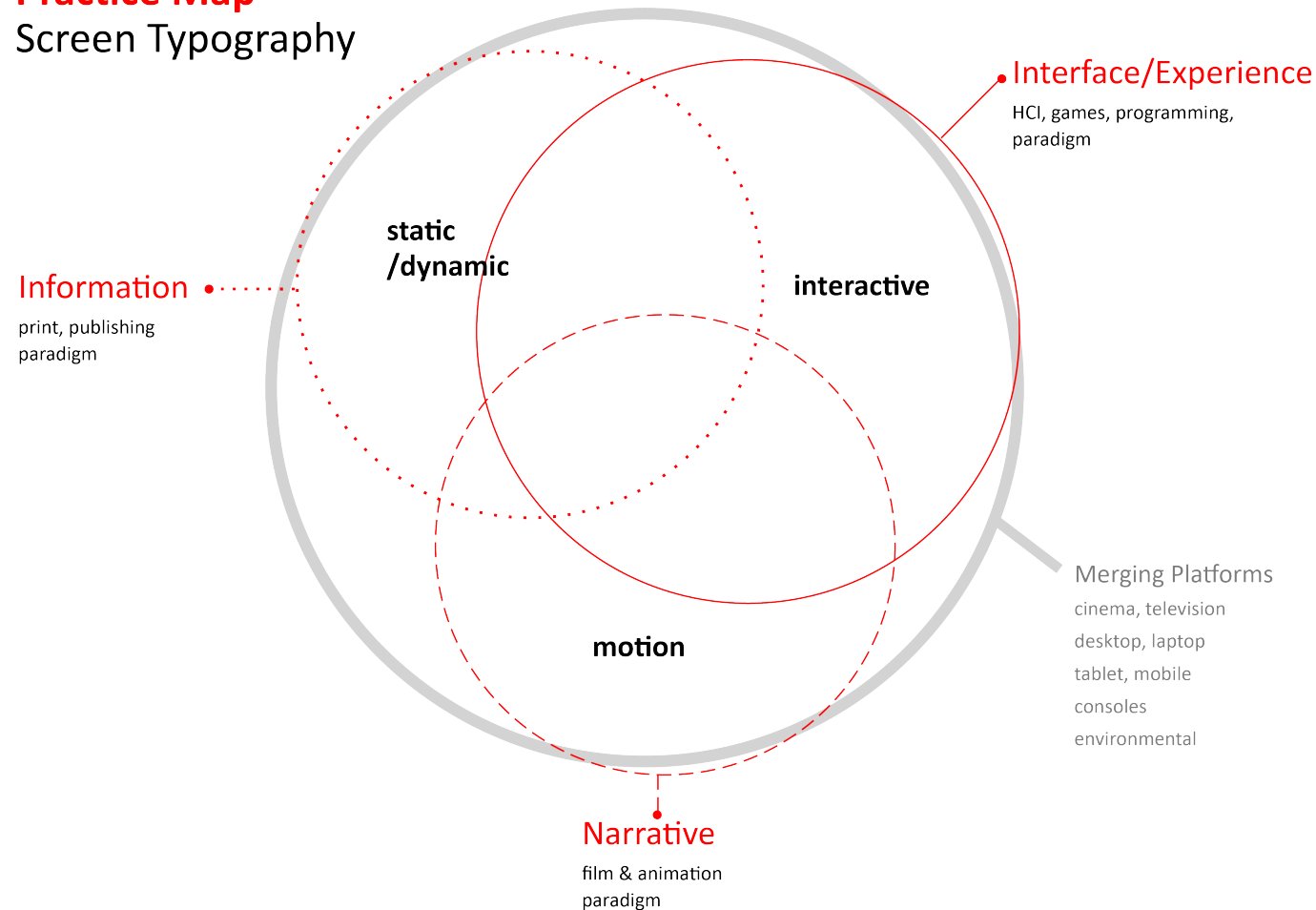
Interface/Experience
HCI, games, programming,
paradigm

static
/dynamic

interactive

Information
print, publishing
paradigm

Merging Platforms
cinema, television
desktop, laptop
tablet, mobile
consoles
environmental

motion

Narrative
film & animation
paradigm

Figure 2.7 Three main areas where screen typography practice occurs. This diagram was developed from a number of paper concept maps and multiple previous iterations drawing from the findings illustrated in diagrams (Figures 2.2-2.6 & Figure 4.1). Several attempts were made to draw a map illustrating the main areas of practice in screen typography and how they could be grouped or classified according to similar attributes or properties (Figures 1.7–1.9). Other earlier diagrams, not presented in the main thesis, are added here (see below) by way of explaining the development of this key diagram.

Figure 1.7 Sketch of related disciplines, topics and keywords. To start with, the main areas for examination in typographic literature and screen typography practice were identified through a process of concept mapping the major topics and keywords relating them to the research field.

Figure 1.8 Concept sketch of related disciplines by theme. Further visual mapping was used to aid the process of sorting, sifting and classifying the disciplines. After a process of iteratively sketching several concept maps the main areas were gradually distilled into categories and thematic inter-related strands under which relevant research material could be grouped and classified. These strands were later used in devising the Literature Map visualisation (figure 1.2).

Figure 1.9 Concept map showing areas related to screen typography practice. The same process of iteratively sketching concept maps was used when trying to define areas of practice within screen typography. A more detailed account is provided in Chapter 2.

Screen Typography Areas of Practice

kinetic typography

interactive typography

user interface

title sequences   idents   ads   promos   games   user interface   web content

experimental films   installation   data visualisation   applications

programmatic/generative

explorative/reactive

signage

information listing   information display

experimental typography

---
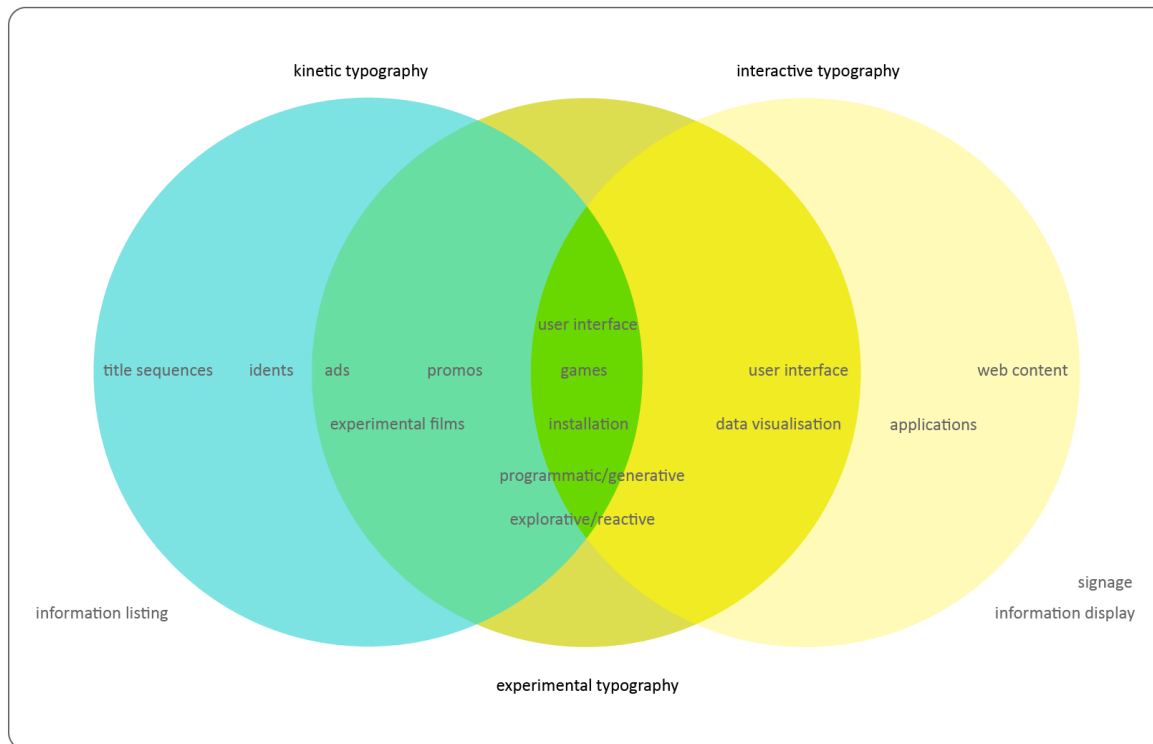
kinetic typography screens
cinema
television
computer
console
mobile devices

delivery format/media
web
digital broadcast/satelite
DVD

interactive typography screens
digital television
computer
console
mobile devices

Practice Map of Screen Typography – diagram (2006) demonstrating ways to group types of screen typography and where they overlap.

Screen Typography

Map of Practice

- ● **motion**
- ● **interactive**
- ● **dynamic**
- ● **experimental**

- ● motion/experimental
- ● motion/interactive
- ● motion/experimental/interactive/dynamic
- ● dynamic/interactive/experimental
- ● dynamic/interactive

The table describes the possible range of attributes that each area of practice may encompass. Examples of practice in the four areas may contain some or all of these properties.

title sequences

idents

ads

web content

type design

promos

user interface

applications

experimental film

games

generative & reactive

installation

data visualisation

info listings

information display & signage
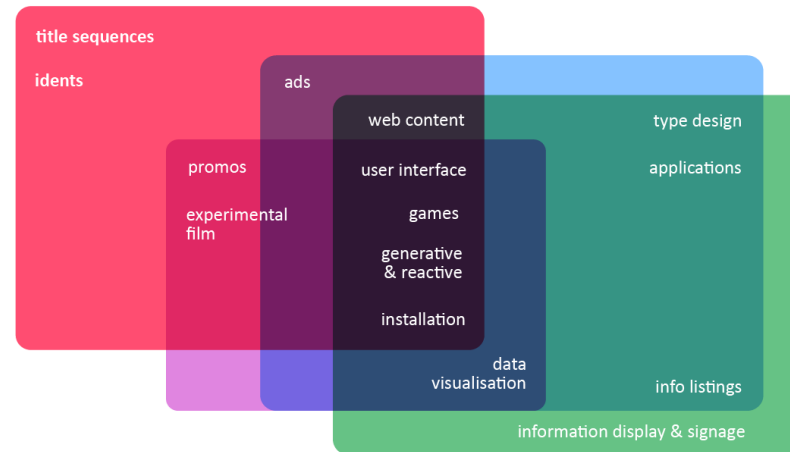
	motion	**interactive**	**dynamic**	**experimental**
typographic properties *multimedia attributes and ditigal characteristics*	animated, image-based, integrating motion graphics, three-dimensional, synched to audio, narrative-based	clickable, editable, searchable, manipubable, responsive programmatically generated, may use dynamic text source (database/CMS)	content and display is updated from digital source (database /CMS) in real-time	any combination of some or all of kinetic & interactive properties
delivery screens *type of screen or device that typography is projected onto, displayed on and interacted with*	[dynamic screen] cinema television computer console mobile devices	[dynamic & real-time screen] digital television computer console mobile devices	[dynamic & real-time screen] custom/various computer	[dynamic & real-time screen] cinema television/digital television computer console mobile devices custom/various
audience activity *how the audience interacts with the typography*	viewed	viewed & interacted with	viewed	viewed & interacted with
delivery platforms /media *types of technology used to publish screen typography*	stand-alone internet digital broadcast/satelite mobile networks DVD/DVD-ROM	stand-alone internet digital broadcast/satelite mobile networks DVD/DVD-ROM	stand-alone internet digital broadcast/satelite mobile networks	stand-alone internet digital broadcast/satelite mobile networks DVD/DVD-ROM

Practice Map of Screen Typography – diagram (2007-9) demonstrating four areas of screen typography practice and table below outlining various characteristics of each group..

Definition and Properties of

Screen Typography

as narrrative	as information	as interface/experience
motion	**static (live)**	**interactive**
film/animation paradigm	*print/page-based paradigm*	*HCI/games paradigm*

merging across platforms

— cinema

— television

— desktop

— laptop

— tablet

— mobile

— consoles

— environmental
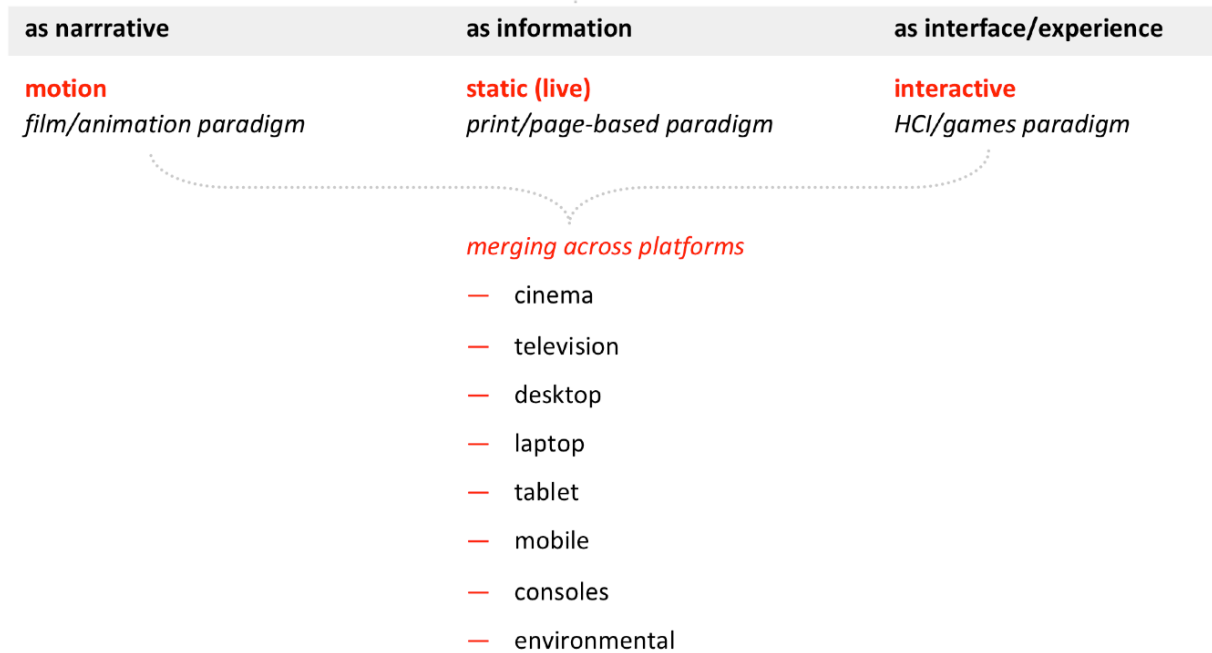
Practice Map of Screen Typography – simplified diagram (presented at ATypi 2010 Annual Conference, Dublin) demonstrating three thematic design paradigms under which screen typography practice might be classified.

Practice Map
Screen Typography

Interface/Experience
interactive
HCI, games, programming,
paradigm

information
display signage

data
visualisation

apps

ebooks

sofware ui's

Information
static dynamic
print, publishing
paradigm

info listings

cdroms

web content

programmatic
/generative

games

fantasy ui's (fui's)

installation

experimental film

Merging Platforms
cinema, television
desktop, laptop
tablet, mobile
consoles
environmental

idents

promos

ads

title sequences

Narrative
motion
film & animation paradigm

Figure 4.1 Practice Map of Screen Typography populated with types of work produced in each area.

Typographic Principles for Design Practice (Print)

Context	Formal Aspects	Structure and layout	Typographic details	Legibility issues	Technique / Reproduction
General knowledge History of lettering Typeface classification Anatomy of letterforms Font families (cases, weights, special characters, numerals, etc.) **Design** (specific context) Text analysis Function of typography Type awareness	**Size** Units of measurement (point sizes, ems) x-height and character width relationship of sizes (Fibonacci etc.) format dimensions **Space** Letter spacing Word spacing Line spacing (leading) Paragraph spacing **Setting** Line length and spacing Alignment Typographic hierarchy and document structure, if applicable (header, footer, folio numbers, chapters, contents, index, prelims etc.)	**Choice and types of format** Paper sizes Paper selection Types of binding **Grid use & development**: including: units of measure number of columns margins and gutters Modular grids Baseline grids Picture grids	**Typographic styling conventions for:** Punctuation Hyphenation Kerning pairs Numerals Symbols, diacritical marks etc. Tabular data Names/addresses	Character recognition Size & text setting Colour and contrast Vision impairment	Typographic sampling Thumbnails Cut and past layouts DTP software production Proofing Files for output

Table 3.2 Table of Typographic Principles for Design Practice (Print). This table was drawn from a laborious process of capturing and comparing the table of contents from a selection of the most recent and most popularly used books on typography design and principles (see Chapter 4, p109-110 for criteria). The lists from these tables of contents were analysed and reduced by grouping similar items or removing duplicates and eventually they were distilled into the above meta-list of typographic design principles for print typography.

This meta list of principles was further analysed and sorted into four main critical strands as outlined in Table 3.3 below.

Typographic Properties, Principles and Methods for Design Practice (Print)			
Context	**Properties/Characteristics**	**Rules/Guidelines**	**Method/Practical Technique**
Function what does it have to communicate? who is the target audience? **Form** what tone of voice, aesthetic style visual treatment is appropriate for the function?	**Typeface Style and Weight** Anatomy of letterforms, typeface classification, font families (cases, weights, special characters, numerals, etc.)	Understanding historical, stylistic, and legible aspects of a typeface in order to make appropriate font selection for design context.	Typographic **sample setting** **Grids** (modular, baseline and picture grids) measurements and number of columns, margins and gutters **Thumbnails** and **sketches** **Cut and paste** layouts **Digital compositions** using DTP software **Paper mockups** & prototypes Digital Files for print production
	Size Units of measurement (point sizes, ems), x-height and character width	Understanding of size sequences & relationships (Fibonacci etc.) and their effect on the visual style, texture, hierarchy and legibility of typography	
	Spacing Letter spacing, word spacing, line spacing (leading), space after/before paragraph, compositional space on page	Understanding the affect of spacing on legibility of words and text and the use of spacing to create emphasis and focal points.	
	Setting Line length and spacing, alignment	Understanding of the relationship of type size and line length in relation to line-spacing and alignment, and their combined affect on the typographic 'colour' of text.	
	Structure (Hierarchy) Typographic hierarchy and document structure, if applicable (header, footer, folio numbers, chapters, contents, index, prelims etc.)	Application of size, spacing and setting principles in relation to bibliographic and hierarchical conventions for document structure and format.	
	2D (Format of Paper) Types of formats (and folds), paper size and number, paper stock, types of binding	Understanding of paper sizes and ratios, and the proportional methods for dividing these (grids) based on an understanding of the laws of proportion (golden section, Corbusier's Modulator etc).	
	Details/Styling Conventions Punctuation, hyphenation, kerning pairs, numerals, symbols, diacritical marks etc., Tabular data, Names/addresses, contact numbers	Application of accepted rules regarding the type style (size, spacing) and setting (alignment etc.) of these details.	
	Colour Contrast of text and background, greyness of text setting	Understanding of basic laws of colour and tone and their application to typography especially with regard to legibility and overall typographic texture.	

Table 3.3 Table of Typographic Principles for Design Practice (Print).

The second critical strand, Properties/Characteristics, shown above was used in conjunction with the diagrams developed in Chapter 2, most especially Figure 2.6, and the Practice Map from Chapter 4 (Figure 4.1) to compare and overlay similarities, differences and gaps identified for screen typography design principles. This critical analysis made a significant contribution to the distillation of properties for screen typography, which are illustrated in Figure 4.119 and in the set of Ruder diagrams below (Figures 6.1, 6.3, 6.5, 7.1, 7.5 and 7.6).

DIAGRAM 1

Practice Methodology

A critical analysis of Emil Ruder's book
Typographie: A Manual for Design

CRITICAL

CONCEPTUAL

PRACTICAL

Philosophy

influences, attitude and aesthetics

Technique, function and formal design are ideas which are quite inseparable in typography.

Ruder, 1967, p.83

Design & Visual Form
Basics
(general)

Typographic Design
Properties
(specific)

Typographic Design
Principles
(critical framework)

Work
samples
experiments

Method

making (drawing/cut n' paste/print)
incremental & generative
variations & multiples
comparative critical analysis (against principles)
iteration

breaking the rules
**contrast
assymmetry
spontaneity**

Figure 6.1 Ruder Diagram 1 – Overview of Ruder's practice methodology. Three critical strands relating to the practice of designing typography were identified as: design basics, typographic design properties and typographic design principles.

Practice Methodology

A critical analysis of Emil Ruder's book
Typographie: A Manual for Design

DIAGRAM 2

Influences → Philosophy ←→ Criteria for beauty

Influences	Philosophy	Criteria for beauty
modernism	**precision, pragmatics & poetry**	objectivity
classical music	craft, function & form	restraint
fine art	contemporaneity 'reflect the spirit of the times'	contrast
japanese culture & aesthetics	practice, master, experiment, innovate	rhythmic order
architecture		asymmetry
		empty space

Design (Visual Form)
Basics → Typographic **Properties** → Design **Principles**

Basics	Properties	Principles
elements of visual form:	typeface (characteristics)	form & counter form
dot/line/plane	weight	arrangement
	size	proportions
laws of visual form:	line space	contrast
(visual perception v's	word space	shades of grey
geometric form)	line length	unity of form & function
	alignment	rhythm
visual contrasts	break & blank lines	spontaneity & fortuity
shades of grey	graphic ornamentation	integral design
colour	format	variations
	grid	kinetics

Functional (rules)

Experimental (rule-breakers)

to be learnt — *invidually understood* — *critically applied*

Figure 6.3 Ruder Diagram 2 – Detailed breakdown of Basics, Properties and Principles for print typography derived from a detailed critical analysis of Emil Ruder's *book Typographie: A Manual for Design*. The list of typographic properties and design principles were then applied and adapted to screen typography following a lengthy analysis (see Chapter 6, Table 6.5 Draft Lexicon of Principles for Screen Typography, p.287-290) and evaluation process (see Chapter 7, Interviewee responses to properties and principles in the practice matrix, Tables 7.3-7.8., p.304-310, and Table 7.9 p.318).

Practice Methodology

A critical adaptation of **Emil Ruder's** *Typographie* for screen typography

DIAGRAM 3

Properties

PRINT & SCREEN
typeface (characteristics)
weight
size
line space
word space
line length
alignment
2D

SCREEN
motion
3D space
sound
interactivity

Principles

Functional
(rules)

form/counter form (space)
arrangement (hierarchy)
proportions (measure)
shades of grey (texture)

contrast
rhythm
kinetics

unity of form & function
(form & meaning)

integral design
(formal unity)

variations
spontaneity

Experimental
(rule-breakers)

Elements

letter

word

sentence

paragraph

document

MATRIX

Element
+
Property
+
Principle

SAMPLE COMBINATIONS

letter + motion, sound + counterform

word + sound, interactivity + unity of form & function

sentence + motion, 3D space + arrangement

paragraph + interactivity + proportions, shades of grey

Figure 6.5 Ruder Diagram 3 – Practice Matrix for Screen Typography devised from critical adaptation of Ruder's methodology. This is the first iteration of the *Practice Matrix.* This list of print and screen properties (in black) is condensed from Ruder's original list. Some of the main principles listed have qualifying descriptions in parantheses.

Practice Methodology

A critical adaptation of **Emil Ruder's** *Typographie* for screen typography

VERSION 2

Properties

PRINT & SCREEN

typeface (characteristics)
weight
size
line space
word space
line length
alignment
2D

SCREEN

2.5/3D space
motion
timing/temporality
sound
interactivity

Principles

Functional
rules

form & counter form (shape)
arrangement (structure/space)
proportions (measure/space)
shades of grey (depth/colour)

contrast
rhythm
texture
kinetics

unity of form & function
(form & meaning)

integral design
(formal unity)

variations
spontaneity

Experimental
rule-breakers

Elements

letter

word

sentence

paragraph

document

MATRIX

Element
+
Property
+
Principle

SAMPLE COMBINATIONS

letter + motion, sound + counterform

word + time, sound, interactivity + unity of form & function

sentence + motion, 2.5/3D space + arrangement

paragraph + interactivity + proportions, shades of grey

© Hilary Kenna, PhD Research 2010

Figure 7.1 Revised version 2 of the *Practice Matrix* for Screen Typography. In the second iteration*, 2.5D* and *timing/temporality* have been added to the screen typographic properties list. *Texture* has been moved from a qualifying description under *shades of grey* and is listed as a main principle and qualifying descriptions have been modified for *form & counter form*, *arrangement*, *proportions*.

Practice Matrix

An experimental practice methodology for Screen Typography
with reference to the teaching methods of Emil Ruder

Properties

**PRINT &
SCREEN**

typeface
weight ·············· (style)
size
line space
word space
line length
alignment
2D

SCREEN

**2.5/3D space
motion
time
sound
interactivity**

Design Principles

Functional
(rules)

form/counter form (shape)
arrangement (structure/space)
proportions (measure/space)
shades of grey (depth/texture)

contrast
rhythm
kinetics

unity of form & function
(form & meaning)

integral design
(formal unity)

variations
spontaneity

Experimental
(rule-breakers)

Typographic Elements

letter

word

sentence

paragraph

document

MATRIX

Element
·····················
+
Property
·····················
+
Principle
·····················

SAMPLE COMBINATIONS

letter + motion, sound + counterform

word + sound, interactivity + unity of form & function

sentence + motion, 3D space + arrangement

paragraph + interactivity + proportions, shades of grey
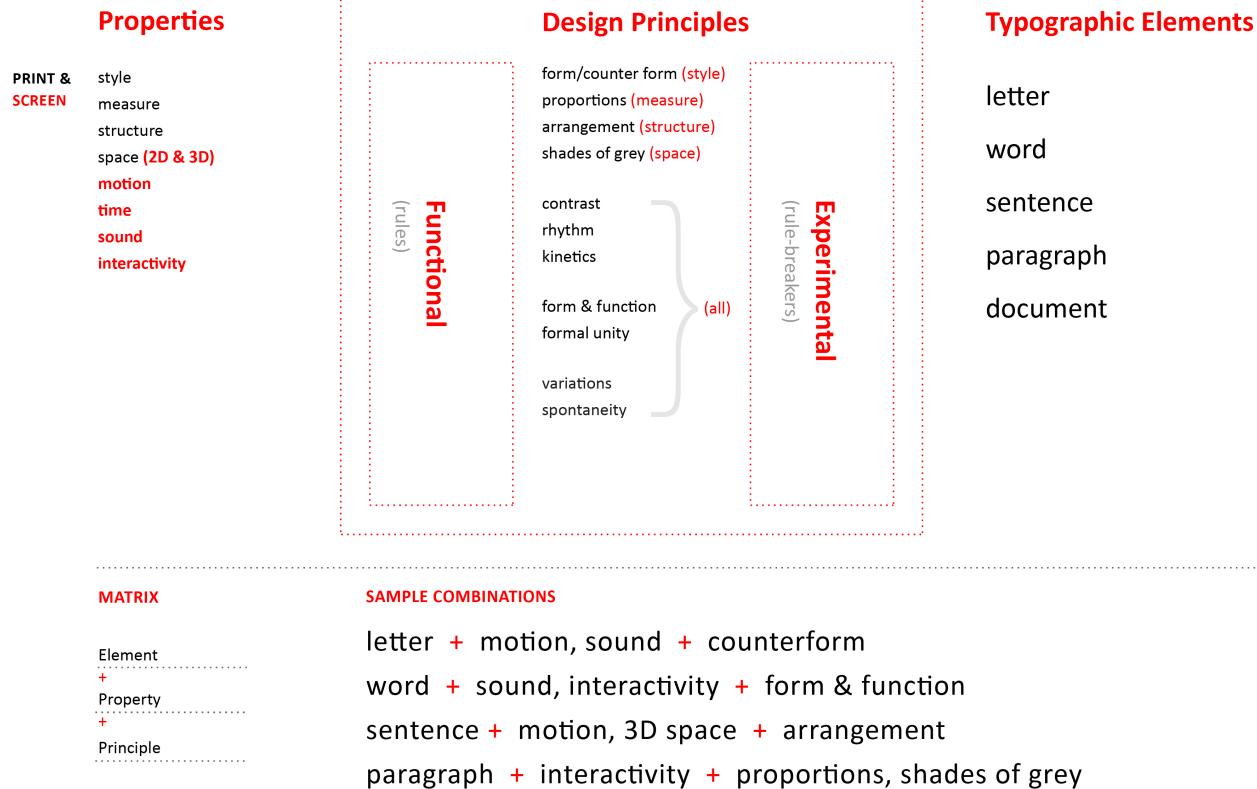
© Hilary Kenna, PhD Research 2012

Figure 7.5 Revised version 3 of the *Practice Matrix* for Screen Typography. Properties *typeface* and *weight* are grouped together under style and *timing/temporality* is replaced by time. Qualifying description for *shades of grey* has been modified.

Practice Matrix

An experimental practice methodology for Screen Typography
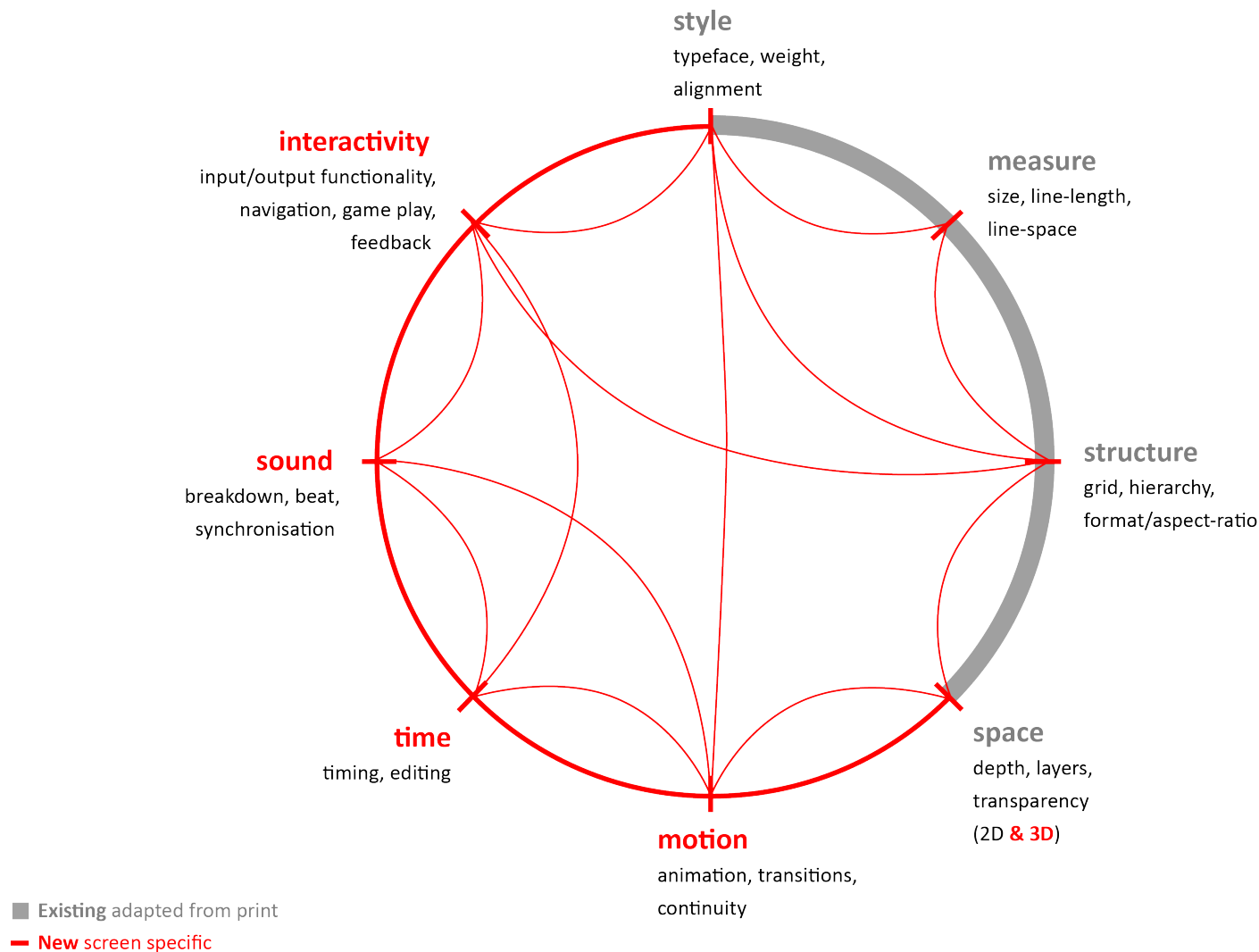with reference to the teaching methods of Emil Ruder

VERSION 4

Properties

PRINT & SCREEN

style
measure
structure
space **(2D & 3D)**
motion
time
sound
interactivity

Design Principles

Functional (rules)

Experimental (rule-breakers)

form/counter form (style)
proportions (measure)
arrangement (structure)
shades of grey (space)

contrast
rhythm
kinetics

form & function   (all)
formal unity

variations
spontaneity

Typographic Elements

letter

word

sentence

paragraph

document

MATRIX

Element
+
Property
+
Principle

SAMPLE COMBINATIONS

letter + motion, sound + counterform

word + sound, interactivity + form & function

sentence + motion, 3D space + arrangement

paragraph + interactivity + proportions, shades of grey

Figure 7.6 Revised version 4 of the *Practice Matrix* for Screen Typography. The current version shows a rationalised list of properties for print and screen. ***Style*** replaces *typeface* and *weight*, ***measure*** replaces *size*, *word space*, *line space* and *line length*, ***structure*** replaces *alignment* and *2D* and also encompasses *grid* (which was in Ruder's original list, see Figure 6.3), ***space*** replaces *2D & 3D*. The principle list now indicates which properties they are most appropriately applied to (in parantheses). The current list of properties developed and refined in the practice matrix is illustrated in more details in the diagram below (Figure 4.119).

Properties of Screen Typography

style
typeface, weight, alignment

measure
size, line-length, line-space

interactivity
input/output functionality, navigation, game play, feedback

structure
grid, hierarchy, format/aspect-ratio

sound
breakdown, beat, synchronisation

space
depth, layers, transparency (2D **& 3D**)

time
timing, editing

motion
animation, transitions, continuity

■ **Existing** adapted from print
— **New** screen specific

Figure 4.119 List of properties of screen typography. Seemingly simple, this diagram is the result of a distillation of findings in the research from Chapters 2, 3, 4, 6 & 7 as illustrated in the series of diagrams presented above. The typographic properties for screen typography are presented here in non-linear format with arcs linking the interdependencies between the different properties. For example, the property of motion may be intertwined with timing, and movement in space (2D, 3D).