

**AT YOUR LEISURE:
ASSESSING EBOOK READER
FUNCTIONALITY AND INTERACTIVITY**

by

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NOTE BY THE UNIVERSITY

This project report is submitted as an examination paper. No responsibility can be held by London University for the accuracy or completeness of the material therein.

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A B S T R A C T

Ebooks are digitised versions of paper-based books and can be read on a variety of electronic devices, ranging from computers to mobile phones. In the past few years, dedicated devices for reading these ebooks have moved into the commercial mainstream, generating criticism from some who say they will be the death of the printed book and garnering praise from others who believe they will revolutionise book publishing. While there have been numerous studies undertaken to evaluate these ebook readers in an active reading context, i.e. for work or study, comparatively little research exists that evaluates their use in passive reading situations, i.e. for pleasure or entertainment. This study seeks to redress this imbalance by identifying the expectations and unique requirements that leisure readers might have when it comes to reading a book on an ebook reader. Ten people, aged between 18 and 68 and who read at least several books a year for pleasure or entertainment, took part in semi-structured interviews designed to assess their current leisure reading activities and to gauge their expectations of the same activities on an ebook reader. These participants were also observed reading a work of narrative fiction in a paper book and on an ebook reader. Inductive thematic analysis was conducted on the interviews and observations, and this approach led to two primary themes being identified: functionality and interactivity. These themes were used to provide the framework for analysis of the findings. These findings suggest the participants associated certain functional properties of their current paper-based leisure reading experience with feelings of ownership, achievement, permanence and value, qualities they did not expect a digital leisure reading experience would deliver as satisfactorily. In addition, this group of readers was shown to interact with their leisure reading experience in a physical way that belies the passive label generally used to describe this type of reading. Based on this research, it is argued that current ebook readers do not adequately address the functional or interaction needs of leisure readers. The present study has made it possible to draw implications for the ways in which ebook readers might be improved to meet the functional and interaction requirements of leisure readers and to offer suggestions for future research.

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1 INTRODUCTION

The printed word is under siege. Newspapers and magazines are in decline, literacy rates are falling (Gomez, 2008), and vertical or "deep" reading (Birkerts, 1994) is losing ground to shallower reading strategies engendered by the hypertext possibilities of a Web-centric world. In an attempt to ride the technological wave and stay relevant, book publishers such as Random House and Macmillan, as well as services such as Google Books and BookGlutton, have, with varying degrees of enthusiasm and success, undertaken digitisation efforts. Naturally, the display technology for these digitisation initiatives is of paramount importance. Ebooks can currently be read on a plethora of devices, from a basic computer to an Apple iPhone. However, the most heavily publicised hardware for displaying this content is the ebook reader – a dedicated electronic device that follows the book metaphor and attempts to offset issues of legibility with E Ink, a revolutionary technology that mimics print-based text in a digital format.

To date, much of the current literature surrounding these devices has focused on reading within an active context – reading by knowledge workers or students. There is comparatively little work available that focuses on the expectations people who read for leisure or entertainment bring to such devices. While the term leisure reading can suggest many types of non-work or non-academic reading, for the purposes of the present study it was applied in the context of reading a narrative work, e.g. a novel. Nell (1988) characterises this type of reading as 'ludic', from the Latin *ludo*, 'I play'. However, his work defines the term in relation to people who read at least one book a week. In the present study, few of the participants met this criterion;

therefore, a decision was taken to use the more generic appellation 'leisure' when describing readers and their reading experience.

Drawing on data generated by interviewing and observing 10 participants, this qualitative study aims to illustrate specific ways in which leisure readers differ from other types of readers and consequently how their use of ebook readers might also differ. Based on a thematic analysis of transcribed interviews and observations, two major themes were identified: functionality and interactivity. What follows is a structured narrative built on these themes, as well as related factors such as ownership, achievement, permanence and value, and the relationships between them.

Chapter 2 will present a review of the current literature that contextualises the digital reading experience, delineates the type of reading experiences these devices support, assesses their functional properties and describes the types of interactions they afford. Chapter 3 describes the qualitative approach used to conduct the interviews and observations for the present study, along with a brief summary of the thematic analysis approach used to code and extract themes from the data. Chapter 4 presents the findings derived from the data within the context of the thematic framework that was identified. Chapter 5 presents a discussion of this framework in relation to the current literature along with implications of the findings for the future design of ebook readers. In conclusion, Chapter 6 suggests opportunities for future research and reflects on the contribution of the present research.

2 LITERATURE REVIEW

2.1 Introduction

In assessing the user experience associated with dedicated electronic reading devices (ebook readers), it is useful to evaluate previous work that has been undertaken. This literature review offers some brief historical background for ebook reading devices, along with a review of the reading process, specifically as it relates to reading on paper versus on a screen. In addition, this review details the research surrounding the types of reading behaviours ebook readers can support, namely, active and passive. Next, this chapter evaluates research surrounding the functional properties of ebook readers and the interactions they afford. The review concludes with a summary of the findings that serves as the basis for the present study.

2.2 The Evolution of Ebook Readers

Ebook readers give leisure readers a new way to read, own and store their books. To put these changes in perspective, it is useful to understand the historical development of these devices, assess the current technology available and examine specific barriers to adoption that might exist.

2.2.1 Historical background

While ebook readers would seem to be a relatively new invention, the origins of these "portable electronic books" can be traced to Kay's 1968 postgraduate work on the flexible extendable, or FLEX, computer language designed to run on a "personal, reactive, minicomputer". This minicomputer would later be called the 'Dynabook', a device Kay and Goldberg (1977) describe as a "self-contained knowledge manipulator in a portable package the size and shape of an ordinary notebook".

As Wilson (2001) points out, there have been many attempts to make good on Kay's vision, starting with early devices such as the Apple Newton MessagePad, the world's first personal digital assistant (PDA) that launched in 1993. Other devices followed, including CD-ROM readers from Franklin Electronic Publishers and Sony (e.g. the Data Discman). These devices, which comprise what Wilson calls the "first generation" of portable ebook readers, had their genesis in providing access to reference materials, i.e. encyclopaedias and medical texts.

In the late 1990s, the Newton gave way to more agile devices such as the PalmPilot and Handspring Visor. This marked the start of a second generation of ebooks that included devices such as Nuvomedia's Rocket ebook and the SoftBook from SoftBook Press. Designed to mimic certain aspects of the book metaphor, these devices targeted leisure readers; however, they failed to gain any significant traction in the consumer market. Kay (in Ryan, 1991) maintains his original vision is still not a reality, citing the often "considerable lag time between the development of a new technology and the realization of the technology's potential". Just as Gutenberg's invention of the printing press took the better part of 150 years to gain widespread acceptance, Kay argues newer technologies will take time to transform the modern world, as well.

2.2.2 Technological advancements

At the time of the present study, a third generation of ebook readers is available that addresses the issue of legibility by offering enhanced screen resolutions. This latest generation of ebook readers is characterised by three types of devices: dedicated reading devices (e.g. the Amazon Kindle, the Sony Reader, the Cool-er reader and the Samsung Papyrus – see Ganapati, 2009), multipurpose reading devices such as smartphones (e.g. the Apple iPhone), and most recently, games consoles (e.g. the Nintendo DS – see Ahmed,

2008). While multipurpose devices give users additional functionality (e.g. a phone, a camera, an MP3 player, gaming functionality, etc) and offer enhanced screen resolutions, only the dedicated ebook readers currently use Electronic Ink (E Ink).

E Ink is a bi-stable display technology that creates a near-paper-like reading experience and requires minimal battery power (DeJean, 2008). E Ink, which was acquired in 2009 by e-paper manufacturer Prime View Technologies, is helping to push dedicated hardware devices for leisure reading (e.g. the Amazon Kindle and the Sony Reader) into the commercial mainstream. Currently, most ebook readers only offer E Ink in varying levels of greyscale, but colour devices are starting to appear (e.g. the Fujitsu FLEPia – see Ganapati, 2009). Similarly, E Ink screens are not yet available for other digital devices such as smartphones or PDAs, but it has been developed for flexible screens (see Tajika, Yonezawa and Mitsunaga, 2008). At the time of this study, smartphones and PDAs relied on third-party application providers to develop software that turns their devices into mobile, 'always on' ebook readers (e.g. Stanza and Eucalyptus for Apple's iPhone).

2.2.3 Competing definitions and standards

While Google has become synonymous with searching on the Web, and the iPod is now considered by many to be the exemplar MP3 music player, the ebook reader has, to date, failed to produce a similar 'category killer'. One possible reason could be the myriad of terms associated with the digital reading experience (e.g. ebooks, ebook readers, electronic books, digital books, etc). Cavalli (2007) illustrates this problem in a discussion of the reasons a possible innovation does not become a true innovation, using ebooks as an example. Similarly, Armstrong (2008) analyses the terms used to describe ebooks, and he maintains the lack of a common term may play a role in reader confusion, again creating a barrier to uptake by the leisure

reading public. For the purposes of this study, the term ebook reader is used to mean the physical, electronic equivalent of a printed book containing a digital version of the whole text of a book (e.g. a novel).

Meanwhile, Harrison (2000) finds the lack of a standard for ebooks has significantly slowed the production of text for the reading devices, with publishers having to produce or reproduce content in many proprietary formats. Snowhill (2001) draws a similar conclusion, while Carden (2008) cautions publishers risk creating "format wars" unless they adopt a model whereby they give users a choice in the way they access the content they purchase, rather than locking them in to a proprietary format.

As of this writing, Wikipedia references more than 20 publication formats, several types of reader software, including Stanza, the Palm Reader, Microsoft Reader, Adobe and Eucalyptus. However, at the time of this study, the primary format battle is between .azw, Amazon's proprietary format (and an off-shoot of MobiPocket), and the open source ePub. (See the Read 2.0 list for ongoing discussions of these issues and many others related the future of the printed word in a digital age.) Bell (2001) sounds a cautious note when he states "unique, proprietary and constantly evolving data formats ... suggest or even guarantee obsolescence". (See section 2.5.2 for a discussion of the nature of permanence as it relates to ebook readers.)

2.3 The Reading Experience

A sizable body of research has been produced that identifies the psychological, human factors and ergonomic differences readers experience when making the transition from reading on paper to reading on a screen. Much of this research focuses on evaluating reading from the perspective of students (e.g. Marshall and Ruotolo, 2002) or knowledge workers (e.g. Sellen and Harper, 2001). For the purposes of the present study, it was deemed useful to

understand the existing literature with a view to identifying how the requirements and expectations of leisure readers might differ. This section also presents an evaluation of the literature that addresses the role context plays in evaluating the reading experience.

2.3.1 Paper versus screen

The literature comparing the reading of paper and online documents is extensive and can be traced to the introduction of computer displays. Dillon (1992) presents a comprehensive review of the literature that had been previously undertaken. His work offers a solid understanding of the issues surrounding reading speed deficits resulting from poor image quality on screens. In particular, he cites the work of Gould, Alfaro, Barnes, Finn, Grischkowsky and Minuto (1987), who conducted a study designed to evaluate reading speed and accuracy on paper versus screens. They conclude image quality is the most crucial variable in determining a reader's speed and accuracy: The greater the image quality, the smaller the performance deficit for screen reading. Later studies (Muter and Maurutto, 1991; Jorna and Snyder, 1991) evaluating improvements in computer screen technology found no difference between reading on a computer screen and reading on paper in terms of legibility or speed deficits.

However, parity between paper and screens in terms of legibility and speed did not guarantee people would *prefer* to read on screens. Sellen and Harper's (2001) landmark study of knowledge workers, a key reader category for ebooks and ebook readers, shows a marked preference for printing documents and working with them offline. The present study seeks to shift the focus to leisure readers and determine how effectively ebook reader display technology meets their expectations and to what extent these devices might offset a preference for printed text.

2.3.2 The reading experience in context

O'Hara and Sellen (1997), in their examination of the way people use paper in a work environment, identify a need to establish a view of reading from the reader's own perspective. They advocate context plays a significant role in the preference of paper over screen. Their findings suggest laboratory methods fail to capture relevant real-world variables inherent to the reading experience, and they suggest such considerations should be taken into account when designing future experimental methods.

Similarly, Dillon (1992), in his review of the literature, finds the majority of studies designed to compare reading on paper and reading on a screen had focused on "outcome" measures of reading, such as speed and accuracy (e.g. Muter, Latrémouille, Treurniet and Beam, 1982). He maintains these criteria do not adequately address the complexities of a "real" reading experience and suggests "process" factors such as manipulation and navigation may play more significant roles in leisure reading experiences.

To obtain accurate process data regarding reading, Dillon recommends the use of an unobtrusive observation method. He also notes most of these previous studies had used a proofreading task to assess differences in presentation media. The present study addressed these issues by designing an experiment that focused on a leisure reading task, using a work of narrative fiction. In addition, to ensure the reading experience was as "real" as possible, each study took place in the respective participant's home (or home of a friend), in a place where he or she would often read, with no contact with the researcher while reading and discreet placement of recording equipment.

2.4 Types of Reading Practices

All readers interact with text for a reason, whether it is to learn something new, escape into a different reality or follow directions to a restaurant. The

literature groups these reasons according to two broad criteria: active reading (for work or in an academic environment) and passive reading (for pleasure or for entertainment). This section presents an overview of these types of reading. In addition, it presents a brief review of the effect of hypertext on reading behaviours, specifically its impact on attention.

2.4.1 Reading behaviours: From active to passive

Guthrie and Mosenthal (1987), in their study of reading comprehension, distinguish between reading-to-do (locating information in documents) and prose comprehension. Goodman (1994) extends these findings by identifying five different classifications of reading: environmental, occupational, informational, recreational and ritualistic reading. It is the more active reading categories (i.e. reading-to-do or occupational and informational) that to date have received the majority of research attention.

For example, a study by Marshall, Price, Golovchinsky and Schilit (1999) highlights the complex strategies the members of a library reading group employ when reading technical papers. These include self-interruption, re-reading, time-constrained skipping and annotation. Their findings indicate the reading strategies participants employ take precedence over specific physical interactions with the device, a conclusion that suggests readability and document layout are more important to these types of readers.

In terms of passive reading, Dillon (1992), in his review of the literature, finds readers differentiate genre on a variety of attributes, including whether they are reading for work or leisure. If the latter, it was found the reading was less likely to be about speed. He suggests alongside active reading, devices and technology will also need to support this more passive type of reading task.

Following on from Dillon's findings, Schilit, Price, Golovchinsky, Tanaka and Marshall (1999) characterise reading along two dimensions: the nature of engagement with a text and the breadth of the activity across texts. They cite Mortimer J. Adler who described people's engagement with a text as varying from active to passive, with passive-single reading most often being associated with serial reading, e.g. reading a novel for entertainment. In the context of ebook readers, Scholnik (2001) supports this view when she states that consulting an ebook for study or reference differs significantly from reading for pleasure or entertainment, where the process is more closely aligned to reading a paper book.

Le Guin (2009) extends the definition of passive reading by attributing more active qualities to a leisure reading experience. She defines reading a book as "an act of attention, of absorbed alertness—not all that different from hunting, in fact, or from gathering". The present study seeks to expand our understanding of leisure reading experiences and identify how ebook readers could be designed to support a more active interpretation of passive reading.

2.4.2 New reading paradigms

The advent of the World Wide Web has enabled screen-based readers to move effortlessly between digital documents via hyperlinks. The conceptual origins of this navigational functionality can be seen in Bush's (1945) prescient description of a memex, "a future device for individual use ... in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility". The "mesh of associative trails" facilitated by this memex would later be realised in the hypertext functionality of the Web.

In recent years, a sizable body of literature has been produced that analyses the effect of such hypertext on active reading behaviours and navigation

strategies. Marshall (2003) addresses the complexity inherent in reading hypertexts. Her work draws upon the theme of attention covered by Levy (1997), who observes we live in an age where the kind of reading we do increasingly seems to involve "short bursts of shallow attendings". He suggests the selection process and subsequent reading of these "endless information fragments" serve to interrupt attention.

It seems reasonable to assume that by fragmenting attention, the Web has served to create a shorter attention span for many readers. Gomez (2008) links this phenomenon to changes in society's generational composition – the allegedly technophobic older generations have given rise to Generations X and Y, dubbed Generation Download, Generation Upload, digital natives or media snackers. To date, there has been limited academic research into the ways in which the Web is changing cognition, but there is some anecdotal evidence in the popular media (Carr, 2008), as well as evidence from the CIBER project (2007), which evaluated the ways in which the Google generation searches for content and conducts research.

Research designed specifically to evaluate reading strategies employed when using ebook readers (Scholnik, 2001) concludes that most ebook readers targeted at passive reading experiences adhere to the book metaphor; hence, readers that are already familiar with reading paper-based books do not need to learn new literacy skills to read an ebook on a digital device. For a detailed examination of literacy in a digital context, see Bawden (2001). It is hoped the present study will augment previous work by identifying ways in which ebook readers might support attention in a leisure reading context.

2.5 Functionality and Interactivity

Leisure reading material (i.e. a book) embodies specific functional properties and affords certain interactions that help define the reading experience

surrounding that material. It is useful to assess the current literature that discusses these properties (in particular, permanence) and interactions. However, as with most other research surrounding the digital reading experience, the majority of previous studies have focussed on active, rather than passive, reading.

2.5.1 Criteria for designing usable ebook readers

Wilson and Landoni (2003) employ the EBONI Ebook Evaluation Methodology as their framework for evaluating the usability of ebooks within an academic community. The EBONI project proposes general guidelines for the design of textbooks on the Web. These guidelines are used in conjunction with findings from the Visual Book project to inform a study by Malama, Landoni and Wilson (2004) on the usability of fiction electronic books. They conclude the EBONI guidelines can be applied to the design of fiction ebooks. However, echoing the findings of Dillon, McKnight and Richardson (1988), they stress it is the appearance of the text that should be the main criteria for designing usable fiction ebooks.

In line with this research, Marshall (2003) identifies certain paper-like reading experiences that are necessary to promote a reader's transition from paper to screen. In her work on the changing nature of reading and the central themes of digital literacy emerging from this evolving digital culture, she suggests a book's mobility/portability, its materiality and physicality (typefaces, navigation, visual cues), its interactivity (the ability to annotate, etc), and the ability to share should be key design considerations. The present study uses Marshall's criteria as the thematic foundation for certain interview questions (see Appendix C).

2.5.2 Permanence in the digital realm

In addition to the problems associated with competing definitions and standards mentioned in section 2.2.3, Lynch (2001) suggests ebook readers face other barriers to adoption, notably the rapid obsolescence of content brought about by changes in technology. As a result, he feels ebooks cannot match the "elegant simplicity of owning and reading bound printed books". He cautions that publishers, by imposing proprietary formats on readers, run the risk of changing the way those readers will use books in the future. Similarly, Bell (2001), in an article describing the CyberAll system for permanently storing media, wonders: "Is paper the only true long-term storage medium?" Le Guin (2009) echoes this sentiment when she states "[...] a book is a thing, physically there, durable, indefinitely reusable, an object of value."

Woolley (2003), in discussing desirable product life expectancies, outlines a "pleasure cycle" for electronic devices that ranges from short-lived and intense to indefinite and intense. He identifies products according to five sectors, ranging from time-specific to timeless, e.g. collectables. This latter sector produces the most pleasure and intense satisfaction. Since many leisure readers collect and organise their books in some fashion, it seems reasonable to assume they might fall into this category. The present study seeks to assess the role permanence might play in the leisure reading experience.

2.5.3 Physical interactions supported by ebook readers

The literature to date suggests most ebook reader design has relied on a paper document metaphor, rather than a desktop metaphor. Research by Schilit et al. (1999), as part of their XLibris project, focuses on the hardware and software requirements of a computer for reading. They identify key ergonomic factors associated with reading that are worth replicating in a digital device. They include reading comfort, page orientation and fixed layout (which promotes spatial memory), annotations, mobility, multiple display

surfaces (that can coexist with paper), and the ability to share (which facilitates collaboration, particularly in a work setting).

Chu, Bainbridge, Jones and Witten (2004) echo comments by Levy (1997) regarding the physical appeal of a book, citing the way a book's physical characteristics, such as its size, heft, etc can "communicate ambient qualities of the document it represents". They also reference the British National Library's "Turning the pages" project (1996), which attempts to provide a "reading experience that more closely resembled a real book". Chen, Guimbretiere, Dixon, Lewis and Agrawala (2008) evaluate a prototype dual-display ebook reader capable of supporting embodied interactions (i.e. flipping and folding) that mimic tasks people perform when reading paper-based documents and books. They suggest a two-screen reading device will more adequately support the embodied navigation practices most people use in work-related reading activities.

In another study of the use of the book metaphor in the digital realm, Liesaputra and Witten (2008) find subjects preferred a 3D representation of a book on screen to conventional digital document displays such as PDF readers and HTML browsers. Their research was designed to evaluate the utility of a realistic book reading experience in an online context. They found key interaction characteristics associated with reading a physical book (e.g. page turning) might hold special importance for readers.

Their findings echo earlier work by Dillon (1992) who suggests the ease with which paper can be manipulated, a skill most people learn early in life, is one of the most obvious differences between reading from paper and screens. He states that reading paper-based material requires manual dexterity: fingers turn pages; they act as a bookmark, holding a place in a book as the reader jumps ahead; or they allow the reader to flip through multiple pages as a way

of browsing or navigating to another part of the book. He points out that electronic text affords no such ease of manipulation. The present study seeks to extend the previous research on interactions associated with active reading to a passive reading experience by identifying key physical interactions leisure readers expect to have with ebook readers.

2.6 Summary

This chapter presented a review of the existing literature surrounding the digital reading experience as a means of contextualising the present study. In charting the historical evolution of these devices, it was possible to identify specific barriers to adoption that might be hampering their widespread adoption by the leisure reading public, namely, confusion over terminology and competing hardware and software issues.

Next, this chapter reviewed some of the key research comparing reading from paper versus screens. It established that advances in screen resolutions have effectively rendered such comparisons moot, particularly in regard to the present study. However, the review helped to underscore the importance of context in the reading experience, a factor that helped inform the design of the present study.

In addition, this chapter summarised the two primary types of reading behaviour ebook readers support: active and passive. It revealed that while there is a sizable body of literature dealing with a digitally mediated, active reading experience, research into similar experiences in a leisure reading context is still limited. This review also addressed new reading paradigms, offering an overview of the role hypertext plays in defining new reading strategies in the digital medium. Of particular interest was the literature regarding the impact of a digital reading environment on levels of attention. This has relevance to the current study since the linear nature of most leisure

reading (i.e. novels) requires a level of focused attention. Finally, the functional properties and interactions associated with a digital reading experience warranted attention, since features such as permanence and manipulation strategies play a significant role in usability and, ultimately, adoption. In analysing the leisure reading experience as it relates to both paper-based books and ebook readers, it is hoped the present study will contribute new knowledge in this area and suggest areas of future research.

3 METHODOLOGY

3.1 Introduction

The goal of the present study was to determine how effectively ebook readers support the attitudes and behaviours leisure readers associate with a paper-based reading experience. This chapter explains the qualitative approach used to conduct the research. Following a brief overview of thematic analysis, it offers details about the participant selection, the research materials used, the data gathering methods employed, and the data analysis performed. It concludes by discussing how the findings were validated and offers a brief summary of the study's limitations.

3.2 Thematic analysis

An inductive thematic analysis was used to extract themes from the data. This methodology assumes a slightly more active role for the researcher in that themes do not just "emerge" from the data; rather, the researcher, with all his or her attendant epistemological biases and predispositions, works to find themes and then creates meaning within and among them (Braun and Clarke, 2006). Conducting this work meant reading and re-reading the data, along with repeated rounds of data categorisation, a process that obviated the need to rely on existing theoretical approaches or research (Boyatzis, 1998). Taking an inductive approach was seen as preferable since the data was gathered specifically for this study and as such had no theoretical underpinnings.

3.3 Participants

The study evaluated a total of 10 participants. Participants were selected based on interest, availability and a self-described affinity for narrative fiction, with most claiming to read between one and three new novels a month. Nine

were recruited either directly or via friends, and one was recruited from a friend's monthly book club. The participants' ages ranged from 18 to 68, and there were five women and five men. The majority were professionals with university degrees who worked on either a part-time or full-time basis, but there was one student and one retiree.

No level of technical expertise was assumed, although this became apparent during the interviews. While knowledge of ebook readers or ownership of one was not a requirement for participation in the present study, all participants indicated they knew what these devices were. Some participants said they had seen advertisements for them or read about them in media articles, and one participant actually owned the device used in the test (she had been using it for a month at the time of her interview to read narrative fiction). All the participants had used a digital device (e.g. PC or mobile phone) prior to this study to read online news, information or academic content.

3.4 Selection of material

The text used in the present study was Emily Brontë's *Wuthering Heights*. This title was selected because, as a classic, it was hypothesised it would have broader appeal and acceptance than a title from genre fiction such as "crime" or "chick lit". Also, it was pre-loaded on the device being used in the study. For the paper-based evaluation, two participants read from their own copy of the book. The remaining eight were supplied with a paperback copy of the Penguin Red Classics edition, published in 2006.

The ebook reader used during this study was the Sony Reader Digital Book, version PRS-505/SC. The PRS holds approximately 160 books, has a 6-inch greyscale screen, weighs nine ounces and utilises E Ink® technology to display the text. In addition, the screen allows for high contrast and high resolution, with a near 180° viewing angle. The text can also be magnified for

sight-impaired readers. The PRS-505 has 192MB of internal memory, and it is capable of displaying Adobe® PDFs, plus TXT, RTF, BMP, JPEG, GIF, PNG and Microsoft® Word files. It can also play MP3 and AAC files.

All the reading sessions and subsequent interviews were recorded on a Panasonic NV-GS230 digital video camcorder mounted on a tripod.

3.5 Procedure

This study was carried out using observation and interviews and took place over a number of weeks. Short background interviews, via phone or email, were conducted with each participant to determine their suitability for the study. During these background interviews, participants were asked about their general reading habits, including what else they read (i.e. print newspapers, online periodicals, etc).

Once selected, each participant was observed and interviewed in his or her own home to ensure as natural a reading environment as possible. After signing a consent form (see Appendix A), the participants were asked to read the first few pages of *Wuthering Heights* in both book form and on the ebook reader and then asked a series of questions. To offset the possibility of preference bias, six participants read from the book first, with four reading from the device first. Participants were asked to read in a place in the home where they normally did the most leisure reading. Several participants identified the bedroom as their leisure reading room of choice but only one allowed herself to be filmed and interviewed there. Observations and interviews of the other participants took place in their living rooms or the living room of a friend.

The first participant study was more exploratory than the others since it was used to determine possible angles for the video camera placement based on

variables such as room layout, the participant's seated position, etc. This initial study helped ensure the data gathering equipment would be as unobtrusive as possible and yet still adequately capture all sounds and verbal responses. This latter requirement was crucial since it was hypothesised that the use of an external microphone, placed either directly in front of the participant or clipped to clothing, might be distracting and/or increase awareness of being filmed. Similarly, to avoid drawing attention to the video camera, it was turned on before the participants started their first reading session and was left running throughout both interviews and second reading session.

3.5.1 Observations

At the start of each session, participants were asked to start reading from the book, either the paper-based edition (their own or the one supplied) or on the Sony Reader. They were informed they would be allowed to read for a specific amount of time but that it was not a challenge to read as many pages as possible. The participant in the exploratory study read from the book for 20 minutes, but she deemed this was "too long", so her subsequent ebook reading session was shortened to eight minutes. On average, the other participants read from the book for 9.85 minutes and from the device for 8.2 minutes (see Appendix B for a breakdown of times by participant).

Prior to reading on the device, participants were given basic instructions about paging back and forth on the device or re-sizing the text. Since this was not a usability study, they were discouraged from spending too much time exploring other aspects of the device's functionality. As soon as each participant indicated he or she was comfortable and ready to begin, they were left alone to read while the video camera continued to record. These reading sessions were then observed during the data analysis phase and the participants'

actions – such as reaching for a drink or manipulation techniques when holding either version of the book – were observed and recorded.

3.5.2 Interviews

The qualitative interviews were semi-structured to create a more conversational style (Marshall and Rossman, 2006) and to accommodate any interesting themes that might be identified. The interviews were divided into two parts. One part evaluated the participants' current reading habits, while the other solicited comments about their device usage and experiences in general and their opinions about using the ebook reader in particular. (See Appendix C for a list of the interview questions.) The interviews covering reading habits took longer (between 10 – 30 minutes) than the ones about device usage (between 5 – 20 minutes).

At the end of the first interview, the participants were asked to continue reading the book in whichever format they had not previously used. They were again allowed to read for a similar amount of time, followed by the second part of the interview. The order of the interviews was determined by the order in which the participants had read the text, with the part of the interview focused on general reading habits taking place after the participant had read the book and the other part (regarding device usage, etc) taking place after the participant had interacted with and read from the ebook reader. Therefore, six participants were interviewed about their general reading habits first, while four were interviewed about their device usage first. As stated previously, the reason for this was to offset any preference bias. Each interview concluded with the participants being asked to compare their reading experience with both formats.

3.6 Data Analysis

As described in section 3.1, an inductive thematic analysis approach was selected to establish a broad framework for interpreting and understanding the body of data and to elicit key themes (Hayes, 2000; Braun and Clarke, 2006). Each videotaped session was transcribed using Microsoft Word, with notations made about the participants' physical movements as they related to both the book and the ebook reader. The data was then printed and read several times to ensure familiarity with the content.

The data was coded manually using a combination of underlining, coloured markers and by annotating each data extract on the printed pages of each transcript. These annotations consisted of descriptive words or phrases (codes) that best summarised each extract (or were actually contained within an extract), along with the relevant participant number. Once all possible codes were identified across the entire data set, a list of these codes was generated. (See Appendix D for this code list.)

To create a way of visualising the data that also afforded manipulation, the printed pages were cut into individual extracts. Extracts with the same code were then grouped together under Post-it notes carrying the name of that code. It was then possible to start identifying relationships and commonalities between the codes and elevate these into themes. In this way, theme piles of coded extracts were built that kept all related data extracts together (see Appendix E for images of these theme piles). It should be noted that if an extract had more than one code, it could be placed in one grouping initially but reevaluated against the themes as they were developed and moved as necessary. Similarly, the theme piles could be grouped and re-grouped as new, more high-level themes were identified. The themes derived from this exercise form the basis for the Findings chapter.

3.7 Validation

The qualitative data analysis in the present study followed an iterative and reflexive process, even though for ease of discussion it has been presented above in a linear fashion. Because the data gathering was spread over the course of many weeks, it was possible to review each video after the data was collected and begin to identify recurring themes. Certain interview questions could then be adjusted or added as needed within subsequent interviews to test the validity of these themes. In this way, it was possible to ground emergent themes within the data.

Further validity was achieved by triangulating the interviews with the observations (Fontana and Frey, 1998). Also, the semi-structured interviews were conducted across multiple participants, using a core group of questions for each. Where the answers to these core questions were roughly similar, it served to validate the themes that were derived from those particular data extracts. As a final validation step, all participants were given the opportunity to comment on a draft version of the Findings chapter. This was emailed to them along with their respective participant number so they could verify the accuracy of their quotations within the text and offer any other pertinent feedback. Comments from the participants who responded were incorporated in the final version of the Findings chapter.

3.8 Limitations of the study

This study relied on purposive sampling to select the participants. Therefore, the limitations of that approach must be considered when reviewing the findings. Also, the results from this study may not be extensible across the wider population of leisure readers. As such, they can only serve as indications of the possible range of expectations leisure readers might bring to ebook readers. However, the findings do offer potential routes into other areas of research surrounding the functional and interactive associations leisure

readers might have with ebook readers. Finally, although the present study attempted to create as realistic a reading experience as possible, future studies might allow readers to select their own texts and offer them a more sustained opportunity to interact with the device and its content. Doing so might help generate an even fuller understanding of the expectations and behaviours of leisure readers.

4 FINDINGS

4.1 Introduction

The present study revealed the opinions and attitudes of the participants in relation to a leisure reading experience in the context of both paper-based books and ebook readers. By using an inductive thematic analysis to evaluate the data from the observations of the participants and from the interview transcriptions, it was possible to elicit two key themes of functionality and interactivity. These themes served as a framework for understanding the expectations such leisure readers might bring to their reading experiences on ebook readers.

4.2 Current reading practices and device usage

This section contains background information about the ways in which the study participants currently use paper books for leisure reading, along with insights into certain social aspects they associate with books. In addition, this section documents why and how the participants engage with the leisure reading experience and examines the unique qualities they feel the leisure reading experience offers. Finally, this section presents a brief summary of the participants' current usage of other digital devices.

4.2.1 *Paper-based book usage*

The study participants described a variety of usage scenarios for their leisure reading, with one of the most common being as a companion on a journey (e.g. on public transport).

"(I'm most likely to read) on public transport and when I'm waiting for people – I think the thing is, if the book is in my bag and I don't have my iPod or anything to distract me, I'll read the book." – P6

"I'll read when I'm out, especially if I have to wait around somewhere... or on the Tube, which is nice because it makes everything go quicker rather than listening to music." – P9

In terms of other leisure reading locations, all the participants said they read in bed, but most acknowledged these sessions generally didn't last too long before they fell asleep – "that (reading in bed) usually lasts about two-and-a-half minutes" (P3). Participant 1 said she could only read ghost stories when she was very tired, while Participant 4 preferred reading travel books or books she had already read before she went to sleep.

"I find that before I go to sleep it's not a good idea to read a book I haven't read before because I might want to finish it!" – P4

While the context in which the leisure reading experience took place did not seem to impact their engagement with a text, the introduction of other media or distractions into the experience did. Watching TV while reading a book was deemed "quite impossible" by Participant 2, and those participants who said they were able to listen to music while reading preferred classical music.

"I can't have too much head noise... if it's a decent book, I want to be paying attention to the book. Classical music doesn't bother me so much... that enhances it a bit but if it's just popular music – rock or something – it will just confuse me or distract me." – P1

4.2.2 Books as social objects

The findings from the present study suggest one of the roles books can play in readers' lives is that of a social tool. For example, Participant 4 said she would discuss books with strangers if they were reading books by authors she rated as "particularly good". Participant 5 also used books as a discussion tool.

"(Books) are a particularly satisfying thing to talk about with other people. [...] It's something pleasurable and kind of completely different to talking about things that seem more commonplace to talk about – it's more interesting talking about books." – P5

Several of the participants mentioned they felt they would "know" (P7) what someone was like based on the book they could see him or her reading, while public reading produced in all the participants a concept of signalling, i.e. that what they were reading was on display for others to see.

"I'm reading Don Delillo's *Falling Man* and I was aware I was reading a book about terrorism on the Tube! So I did look up to see if anyone was aware of what I was reading but I only thought about it for 20 seconds." – P5

While the majority of participants said they belonged to at least one online social networking service, only Participant 4 used an online book discussion forum to learn about new books and exchange ideas about books. Participants 1 and 2 belonged to an offline book club, and all the participants said they had shared books (some more than others) with friends, family and/or work colleagues.

4.2.3 Engaging with the leisure reading experience

While reading for entertainment can encompass many different types of reading (e.g. a blog about pets or a Twitter "tweet"), the present study was concerned with the reading of narrative fiction, since it is this type of reading current ebook readers have primarily been designed to support.

Adler and van Doren (1972) characterise the stereotypical immersive reading experience most often associated with narrative fiction as "passive". However, data from interviews with the participants in the present study suggest some

of them experience a level of cognitive involvement with their reading material that belies the "passive" label. Participant 6 described how a book "becomes part of you", while Participant 9 stated she liked the "transition from reading something to picturing something". Other participants echoed this notion of creating visual images as they read.

"You know how sometimes if you're reading... the whole thing kind of comes to life. It's almost like you have pictures of who those people are in the scene as you're reading it." – P8

"Being the reader, you have to contribute part of (the) vision and so your own understanding goes into it. Also, you're so much more in communication with the author's ideas, not just the story, you know? It just engages your mind so much more." – P1

Such deep engagement with their books determined the amount of time that some participants would spend reading.

"Half-an-hour, an hour perhaps... it depends how absorbed I am in something. I might read for an hour-and-a-half if I'm really absorbed in something..." – P2

"It depends – if it's a good book and I'm into it, I might sit and finish it... But that's probably the most extreme." – P8

4.2.4 Leisure reading as a unique experience

Each of the participants cited different reasons books were important to them. Participant 2 thought they opened up "a whole world of information" that couldn't "be acquired in any other way"; Participant 3 felt they gave him access to a "secret" he wondered if he should keep to himself; and Participant 4 liked the fact books exposed a commonality of life experience by helping her

realise "you're not unique at all". However, all the participants made a distinction between reading a book for pleasure and engaging with other types of media such as TV, music or films.

"I don't know what I would do without books, really. I know it sounds silly given that I only read 10 or 15 minutes a day [...] They do just hold so much more weight in your mental life - it's not like TV that is just being fed into you." – P1

"I think the content of some books doesn't occur in other media – some niche kind of things, some very powerful and useful things." – P3

"You tend to become more attached to (books) than you would a TV show or a film just because it takes you so long to read them. [...] I can still find myself lost in books and I think that's important – I don't really find that with anything else." – P7

4.2.5 Current device usage

All the participants owned mobile phones. Six (P3, P4, P5, P7, P9 and P10) owned standalone digital cameras, and eight owned iPods (all except P2 and P8), with most of them claiming this device as their current favourite. Aspects of these digital music players that appealed to the participants included their capacity to hold "so much music, so easily" (P5) and their ability to let users "cherry-pick" songs, which created a "mix-tape kind of situation" (P1).

Only one of the participants (P8) already owned an ereader, specifically, the Sony Reader. She had been using it for a month when the study took place. Participant 4 had read poetry on her iPhone using the Stanza application, and Participant 3 had used the Amazon Kindle once ("I wasn't trying to read something, I was just trying it out").

4.3 Functional properties of paper-based and digital books

For the participants in the present study, books embody a wide range of desirable physical characteristics. This section presents data from the interviews with the study participants that reveal specific physical attributes they associate with both paper-based books and the digital reading device.

4.3.1 Tactile appeal

For several participants, paper-based books offered desirable tactile qualities. They echoed Levy (2001) who posited that books appeal to a "multiplicity of our senses" and that the physical attributes of books serve to create the "dimensions of the reading experience". Participant 2, who had worked in publishing, had a love of books "as a physical object, especially a nicely bound book", and Participant 5 echoed this notion of 'object-ness' when he was asked how he might feel about an electronic reading device.

"I think people are more protective of the experience they have with books than with music. Because you're constantly in touch with the physical object whilst you're reading, whereas listening to music, you're separated from the music once you've put it on." – P5

Similarly, Participant 3 liked the fact that "what you see is actually what you interact with" and that books had stability and retained their state, allowing the reader to "...return to something where you left off" (P3), while Participant 1 declared a particular fondness for library books:

"I like those kind of old books where you've got that kind of thick paper and they do have a certain smell and the older typefaces which are bigger I think and the pages turn over easily – all of those things, it's hard to say just one thing. I do love all those aspects of reading a book. I even like the crinkly plastic library covering." – P1

4.3.2 Ownership and achievement

Since seven of the participants were interviewed in their homes (P1, P2, P3, P4, P5, P6, and P8), it was possible to see their book collections. Six had at least one shelf for their books, if not entire walls in one or more rooms. It was not possible to interview Participants 7, 9 or 10 in their respective homes, but each said they had collections of books, either in boxes or on shelves. While Participants 1, 3 and 4 had started to limit their book acquisitions (e.g. by using library books) because they felt they had too many books or did not want to add new books to their collections, Participant 7 liked the fact he had "a lot of books".

Participant 2 suggested the appeal of physical books for him was a habit, while Participant 7 described "having a hard copy" as "something you almost learn". Participant 6 suggested she "fel(t) better about (herself)" because she owned books and had them on her bookshelf.

Participant 10 associated a sense of achievement with physical books, saying he liked the way they offered him visual cues about his progress. When asked if this was in relation to seeing the page number increase, he replied:

"No, it's more about having a collection of pages getting larger here (indicates left side of book) and one getting smaller here (indicates right side), rather than being aware of how many pages I've necessarily read in numerical terms." – P10

As a self-described "poor reader", Participant 6 also found paper-based books offered a visual way to monitor her reading accomplishments.

"Once I've read (a book), I just feel proud of myself when I've finished one or if I've got close to the end [...] (It's) like if you go to the gym

instead of vegging out in front of the TV, you feel good for it because you're physically doing something." – P6

4.3.3 Permanence and value

In line with the concept of technological obsolescence described in Chapter 2 (e.g. Le Guin, 2008 and Woolley, 2003), the participants in the present study were concerned about the permanence of the content on an ebook reader.

"I've lived with the children's grief when their iPods have died and they've been unable to recover their music, and the idea of that happening with books is just too sad." – P4

Participant 9 stated that "this (the Ereader) could just break" and that it was "more temporal". Participant 5 felt she would "have to be careful with it", while Participant 8 acknowledged "there will be a much whizzier version in 2-3 years' time".

"Technology moves on so quickly, doesn't it? Which, of course, is another problem, isn't it? If you've spent £150 on that and a fair amount of money on downloading 10 books, and then next year it's out of date or if it goes wrong, you have to get it repaired. Or do you have to buy another device?" – P2

"None of these devices really last very long [...] whereas if you have a book, unless it burns or you decide to get rid of it, then it's going to stay and get nicer." – P9

In a related vein, several participants expressed a desire to own physical copies of books they liked or that were significant in some way.

"I'd always want to have the book, especially certain types of books like classics or coffee table books. [...] Books are not ephemeral. They'll

always be around... And I'd feel a book was more mine if I owned a physical copy... The best thing you can build up is a library because you'll always have it." – P6

Participant 5 described using physical books as gifts. This concept of physical artefacts having more 'worth' than their digital counterparts was reflected in the participants' attitudes towards other media. Several preferred physical photos, not digital, since they were "somehow more important" (P4), and they liked sending cards at Christmas rather than "group emails" (P6).

"If I [...] thought (a book) was great and wanted to give it to someone, I'd give them a physical book. In the same way that people haven't gotten around to giving MP3s as gifts – they still give a CD." – P5

4.3.4 Physical attributes of the digital reading device

The majority of participants stated they enjoyed using the Sony Reader, commenting favourably on its "slim line" (P7) shape and its weight. However, Participant 2 said he found it to be "surprisingly heavy" following his reading session with the device and declared that having to push the pagination button required a "positive effort". However, the experience of Participant 8, who had been using the device in question for a month (and while on holiday), contradicted these assertions.

"It's slightly better to hold on the beach – ordinarily, if you have a big, thick book, your hand can start to ache!" – P8

Most of the participants found the text on the Sony Reader's screen to be "legible" (P4).

"I was quite pleasantly surprised that it wasn't like a computer screen, like, tiring on the eyes. It was quite matte – like a page matte." – P5

"I had misgivings about them because I thought they would give you a headache. [...] I only read for a short time but it doesn't seem like it would. It's quite gentle, isn't it? It's not back-lit in a horrible way." – P7

Only Participant 2 disliked the screen resolution and contrast. As the oldest of the participants (68), it is possible he had unique requirements (e.g. issues with manipulation or eyesight) that might affect his use of the device. The present study was not designed to accommodate this possibility. However, further research could be conducted to evaluate the usability of ebook readers within specific user populations such as senior or handicapped readers.

4.3.5 Dedicated devices versus multi-purpose

Given the fact that five of the 10 participants were under 25, it had been hypothesised at least some of them might express a preference for a multi-functional device (e.g. a smartphone). However, this was not the case, with all the study participants expressing a preference for a standalone device, one that "just served its purpose" (P6).

"I'd much rather have something simple that did one thing unbelievably well. [...] This should be for reading." – P4

For many participants, the issue was one of attention. Participant 5 felt additional functionality would allow him to "click away", forcing him "to have to regain (his) concentration". Participant 10 echoed the themes of engagement and of books as a unique experience (introduced in the findings in Sections 4.2.3 and 4.2.4, respectively) when he said:

"If you're reading a book, you're reading a book. I don't really like things to take my mind off it." – P10

However, Participant 10 expected a connection to the Internet that would allow him to "download books if nothing else". While some saw the benefits of being able to download books directly from the Web onto the device, some felt this then made them "always accessible" (P8).

"Reading is like a hobby and it's personal and it's time for yourself. [...] You don't want the possibility of being interrupted or having the rest of the world around you because then it takes away the escapism of a book... At what point does it stop being an ereader and start becoming a computer?" – P8

Participant 3 wanted to be able to read other types of documents (e.g. magazines, newspapers, etc) on a digital device. However, he wanted "a different format for each one" and said he would carry multiple devices if necessary. Participant 4 echoed a willingness to do this, saying she carried "three or four devices already".

4.4 Interactivity afforded by paper-based and ebook readers

One of the aims of this study was to determine if there was scope to extend the current literature, with its focus on interactions associated with active reading tasks and outcome measurements, by evaluating passive or leisure reading. The following section presents findings that suggest leisure readers engage in physical interactions with their paper-based reading experiences that are not adequately replicated by an ebook reading experience.

4.4.1 Interactions afforded by paper-based books

As described in Chapter 2, active reading is characterised by the ways in which readers physically interact with their books (e.g. underlining, annotating, etc). People who read for pleasure generally do not engage in such activities, confining their interactions to navigation strategies such as

paging back and forth (Schcolnik, 2001). The participants in the present study followed this paradigm, with a few saying they might occasionally identify books as *theirs* in some way (i.e. writing their name in the front pages - P2, P4, P5, P6) but only one said she would actually write in the body of the book itself (P1).

The one area that drew clear preferences from participants was that of how they saved their place in a book. Four people (P1, P2, P4 and P7) reported using a physical object such as a bookmark or piece of paper to save their place, five (P5, P6, P8, P9 and P10) said they folded the corner of the page, and one "just remembered" (P3). The non-folders were particularly vehement about their disdain for people who folded pages, with Participant 2 exclaiming: "Ooh, what a terrible suggestion!" and Participant 4 saying: "People who turn down corners drive me berserk!"

However, the five "folders" displayed similar passion for their choice to interact with the pages of their books. They described feeling more engaged with the books they were reading when they physically marked them in some way.

P6: "I had this really Christian teacher once who told me books should be treated like you'd treat yourself or the Bible. You shouldn't put them on the floor or bend them. But books are meant to be your own..."

I: "Can you tell me what you mean when you say 'your own'?"

P6: "If you're not comfortable with breaking it or bending it or ripping it, it's like you're not comfortable with it. You have to be able to throw it into your bag and not worry about it."

Likewise, Participant 5 preferred worn out books to new ones, saying he "like(d) it more when (he'd) battered a book", and Participant 9 also commented on her physical interactions with books as representing a similar level of engagement with the reading experience.

"I like it when you mess up books because then I feel like I've read them properly." – P9

It is worth noting Participant 6 described herself as "really bad at reading", while Participant 9 declared she was easily distracted when reading and often had to go back and re-read as she moved through a text. Participant 5 felt a paper book offered greater cognitive support, since he could "just glance back to the immediate bit" if he had "got (his) facts muddled" without having to click anything. Future research is warranted to determine if a more physical reading style does, in fact, increase attention and comprehension for poor or immature readers and whether digital devices could be designed to accommodate these types of readers.

4.4.2 Interactions afforded by the ebook reader

Several of the participants said it was easier and/or faster to read on the device than from the paperback, largely because of the text adjustment facility. Participant 9 found increasing the size of the text gave her a more "continuous" reading experience, which in turn allowed her to move through pages more quickly and increased her sense of satisfaction.

"I think it's easier to follow when it's like this because you don't really start reading from the same line. You know where you read the line over again by accident? I didn't do that here. I found it was quite quick and I sped up – I felt more involved." – P9

"I think it's less intimidating. It's easier for your eyes to breathe, for your head to breathe. Just press the button and it just rolls easier." P6

However, the text customisation functionality had some downsides for several participants who commented on the fact that having less text on a screen meant the number of pages to be read increased. Participant 2 observed this would mean "you'd be continually pressing that little button", while Participant 4 noted that while it didn't "bother" her, since she had read book content on her iPhone (which offered "much less space"), she thought that "someone who wasn't very into reading might say it's too long". Again, future leisure reading research might be warranted to determine if ebook readers could increase reading speed, comprehension and satisfaction, particularly for less accomplished readers.

The participants' opinions were relatively divided regarding the way the device handled page transitions by flashing from black to white as the E Ink rendered the text on the screen. Some didn't notice it, or, if they did, they felt it was "instantaneous" and stopped "your concentration being broken" (P5). However, other participants found it to be "disconcerting" (P2).

"It's slightly annoying because I tend to read quite immersively and so it interrupts the flow." – P4

"The reason it's distracting is because it breaks your concentration. In a story, you have a mental image of a piece of text... It's kind of abstract in your mind and you fill in the blanks. The black-and-white transition kind of interrupts that continuous experience." – P3

4.4.3 General interaction observations

To date, much of the research designed to evaluate how readers make the transition from page to screen has taken place in controlled lab studies. This

can be attributed to two factors: first, the focus of this earlier work has been on outcome-based, active reading (e.g. proofreading a work document). Second, as Marshall (2003) points out, it is considered "almost creepy" to watch someone else read.

However, the present research found otherwise. Once they were left alone for each reading session, the participants (bar a quick glance from two participants) never looked at the camera or even looked up from the book or ebook reader as they read. As soon as they turned their attention to the book or device, they conformed to the cultural stereotype of solitary reflection and concentration with the book as the object of attention (Levy, 1997) until the researcher returned to the room. Nell (1988) characterises ludic reading as effortless, whereby the reader is relaxed and is less likely to be distracted, and these findings would support both his characterisation of the ludic reading experience and that of Scholnik (2001), who found that even while observed, participants engage in a natural reading experience and are able to focus their complete attention on the book in front of them.

Every participant but one crossed their legs or raised their knees and rested the book or ebook reader against a thigh (or both thighs if they had raised their knees – P1 and P8). Of these nine, eight were able to rest one or both arms or even the book or device against the arm of a chair or were supported by pillows on a bed (P1) or a sofa (P8). Participant 2 sat with both feet on the floor (mainly because he had a cat on his lap during most of both reading sessions), and he held his arms alongside his body with elbows bent. Participant 3 rested either one ankle or the other on the opposite leg and would rest the book or device on his knee, but since he did not have arms on his chair, he kept his arms alongside his body. It is noteworthy that of the 10 participants, Participants 2 and 3 were the ones who commented on the fact that the ebook reader felt "heavy" or made their hand or hands ache. The lack

of physical support for their arms and forearms may account for this difference.

4.4.4 Interacting with paper books

The observations of the study participants as they read from the paper-based book suggested they employed specific manipulation techniques when holding and reading a book. Overall, reading from a paper book was observed to produce more physicality in the readers, with each of the participants exhibiting his or her unique style. Some would hold the book with just one hand, with the spine of the book resting in the palm and the thumb of that hand separating the two halves of the book. The free hand would be used to support their head (either against the palm of the hand or a fist), touch their face, hold a cigarette or pick up a drink.

Some participants used both hands to hold the book, with the left and right side of the book anchored against their fingers by their thumbs on the inside pages. Some would hold the book on the left side with their left hand while keeping the index or index and middle fingers of the right hand behind the page they were about to turn. As they made this turn, several were seen to smooth the "turned" page down onto the left-hand pages, sweeping the right hand across before returning it to either hold the right side of the book or to the arm of the chair, to support their head, etc. Participant 4 was the only one who smoked a cigarette while reading. She held the cigarette in her right hand and when she needed to turn a page, she would use this hand, but she used the ring and pinkie fingers to grasp the right-hand page and push it across. All the participants were observed to move their heads in the direction of the page they were reading, i.e. turning their head to the left as they read a left-hand page and vice versa for a right-hand page or sometimes even shifting their body weight in the opposite direction of the page they were reading, e.g. shifting right as they read a left-hand page.

4.4.5 Interacting with the ebook reader

As mentioned, both reading sessions absorbed the participants' full attention. However, in the reading session with the ebook reader, the participants were observed to be far less physically active, with most remaining practically immobile as they read (e.g. P5 and P9 did not change position at all for the majority of their respective reading sessions). Only one or two were observed to shift their position slightly but not to the extent they had done with the book. In fact, all the participants kept their heads virtually still as they read, not needing to turn them left or right or even move them up and down.

Only Participant 3 was observed changing the position of his hands on the device while reading, switching from holding the device with both hands and using his right thumb to press the pagination button to supporting the book in his left palm and using that thumb to operate the additional set of navigation buttons the device offered, leaving his right hand free to reach for a cup of tea. All the other participants held the device with both hands and used their right thumb to "turn" the digital pages. While handedness was not an area of concern for the present study (the device accommodates for this, anyhow, by having two sets of pagination buttons, one on the bottom left and one on the right side), future study may be warranted to determine how being right or left handed impacts the level of interactivity a reader displays when using the device.

Eight of the participants held the device as if holding a book, with the left-hand cover of the device open. However, Participant 1 folded the left cover behind the other cover and body of the device, and at one point during her reading session, Participant 9 attempted to do the same but changed her mind and kept the left cover extended. At one point during her reading session, Participant 6 was seen to insert the fingers of her right hand between the body of the device and its right-hand side cover as if preparing for a page turn

with a paper book. Participant 3 made a gesture with his left hand, moving it from his lap to the right side of the device as if reaching up to turn a page and then back. Since this gesture was not observed until the session recording had been viewed, it was not possible to determine if it was intentional.

4.5 Summary

Naturally, paper-based books played varied and important roles in the participants' lives, and the findings showed they used them as companions, as social objects or to meet a unique entertainment need. Books as physical objects also conveyed a sense of ownership, achievement, permanence and even value. Alongside these functional properties, the findings suggested specific qualities related to interactivity that paper-based books afforded such as the ability to manipulate them and engage with them on a physical level.

While the form factor of the ebook reader was generally well regarded, in particular the screen resolution, the interviews suggested other factors (e.g. the potential for data obsolescence or the distraction that a multi-purpose device might pose) were a cause for concern. In terms of the interactions afforded by the ebook reader, the observations highlighted a rather surprising finding, namely, that the participants remained virtually immobile while they read from the device.

These findings would suggest the functional and interactive properties the participants found desirable or displayed when using a paper book for leisure reading might not match a similar experience on an ebook reader. The next chapter will relate these findings to the existing literature. It will also explore the implications for the design of ebook readers targeted at leisure readers.

5 DISCUSSION

5.1 Introduction

By applying thematic analysis to the findings presented in Chapter 4, it was possible to derive two primary themes of functionality and interactivity that encapsulated the opinions and attitudes of the participants in relation to their leisure reading experiences. These findings suggest paper-based books possess certain desirable functional qualities and afford their users specific interaction capabilities that current ebook readers may not yet support. This chapter will discuss these themes in the context of the literature review presented in Chapter 2. In addition, it will present a brief summary of the implications for the design of future ebook readers, ones that might offer more effective support for the unique requirements of leisure readers.

5.2 Functionality

For well over 20 years, researchers have been evaluating the ability of screen-based text to mimic its real-world counterpart, the printed word. Much of this earlier work (e.g. Gould et al., 1987; Sellen and Harper, 2001) focuses on the transition as it applies to a specific category of reading, i.e. active reading, of the kind most often carried out in a work or academic context. Far less attention has been paid to the passive reading category, i.e. leisure reading. However, these readers are significant consumers of the written word and understanding their unique functional requirements has been one of the focuses of the present study.

One requirement involves the legibility of screen-based text, with several studies suggesting this should be a key consideration when designing usable ebook readers (e.g. Gould et al., 1987; Wilson and Landoni, 2003; Malama, Landoni and Wilson, 2004). This issue has been addressed with the

development of E Ink, a pixel-perfect approximation of printed text. The present research shows all but one of the participants found the ebook reader's text display compared favourably with the printed version of the book. Since this issue of legibility would appear effectively resolved, it now appears the design of these devices will need to support other functional criteria in order to meet the needs of leisure readers.

5.3 Permanence and value

The present study suggests one area of concern for many of the participants is permanence, or rather, a lack thereof. Paper-based books have created a reliable mental model that presupposes permanence. While the general reading public may be confused by competing definitions and standards (Harrison, 2000; Cavalli, 2007; Armstrong, 2008), they do expect the books they buy to last.

The participants in this study echo the concerns Lynch (2001) expresses regarding obsolescence, with many of them declaring a preference for having a physical book collection. Wooley (2003) equates such collections with the ultimate in product satisfaction and pleasure. Tied to the appeal of having physical book collections is a concept of value – the participants feel paper-based books are somehow "worth" more than their digital counterparts (i.e. "coffee-table" books or books as gifts). These findings align with Le Guin (2009) and her description of a book as "an object of value".

5.4 A standalone experience

Numerous pages of text have been produced to explain why books should be or will remain viable artefacts for many years to come (e.g. Birkerts, 1994; Levy, 2001; Gomez, 2008). Reasons cited often include people's affection for books, their love of tactile objects, or the fact books can embody experiences and encapsulate knowledge. Books offer, as Silberman (1998) suggests, more

than journeys – they can be destinations in themselves, offering an "interval of communion" in which "we are transported".

The findings from this study support that assertion, with many of the participants describing their leisure reading as somehow special or unique. They "make time" to read, and they see books as a part of their lives, serving as companions on journeys or as a component of a relaxing holiday or as a useful basis for social interactions. This view of reading as a unique experience could explain why the majority of the participants expressed a preference for a standalone device rather than one that encouraged multi-tasking. So, while commercial interests might suggest more is better when it comes to devices, it would appear that for the participants in the present study at least, the one area where they draw the line regarding the ability to multi-task is with their leisure reading experience.

5.5 Actively passive

The findings from the present study corroborate research by Guthrie and Mosenthal (1987), Dillon (1992) and Scholnik (2001) that found leisure readers engage with reading material in a different manner from knowledge workers or students. Far from adhering to a rigid definition of passive reading, the participants in the present study took a much more active view of their leisure reading experiences. They described how they must "contribute part of the vision" (P1) and how books "become part of them" (P6), how they can "become lost in them" (P7), and how "the whole thing kind of comes to life" (P8). These findings support Le Guin's assertions that leisure reading, certainly on a cognitive level, requires active participation by the reader.

Extending the definition of passive reading still further, the present study suggests leisure reading can have a physical dimension. Marshall et al. (1999) and Adler, Gujar, Harrison, O'Hara and Sellen (1998) attribute specific

physical activities to the process of active reading such as annotation, re-reading and skipping. However, the present study suggests that just because leisure readers do not engage in these types of activities when reading a paper book does not mean they do not display other physical behaviours.

Of interest in this study is the finding that reading from the ebook reader produced far fewer physical movements, rendering the majority of participants motionless as they read. Such immobility would appear to run counter to many of the participants' assertions in the interviews that they equated physicality with a sense of ownership and achievement. One participant in particular (P6) described how she liked to "mess up" books in order to feel as though she had "read them properly".

It is worth noting the present study did not measure the distance from the book or the ebook reader from the participants. Yet, as stated in Muter and Maurutto (1991), readers do have preferences for a certain optimal visual angle of the characters. They found readers spontaneously adjust the reading distance accordingly. In the present study, such limited movement with the ebook reader could be attributed to the fact that the participants were able to achieve an optimal visual angle by adjusting the text with the device's text adjustment functionality, rather than having to reposition the book.

Similarly, the participants' limited range of motion while reading could result from the ebook reader's form factor, which dictates a more compact area of attention (Levy, 1997). With less text on the ebook reader's screen than would generally appear on a printed page, coupled with a single viewing screen, readers have less need to move their heads. In discussing the ergonomics of reading, Schilit et al. (1999) suggest that since dedicated electronic reading devices are based on a paper metaphor and not a desktop metaphor, they can give readers a screen-based reading experience yet still

offer greater flexibility in terms of mobility and positioning. However, the present study would seem to suggest leisure readers might not always take advantage of this mobility.

5.6 Implications for design

Since the present study has demonstrated that the functional properties and interaction affordances of paper-based books fulfil particular requirements for leisure readers, it follows that future ebook reader design should accommodate these requirements, where possible.

5.6.1 Functional requirements

In terms of functional properties, the present research suggests there is a requirement for ebook readers to offer leisure readers the ability to maintain some form of archive as a way of guaranteeing permanence, signifying ownership and communicating achievement. Online sites such as Shelfari, LibraryThing or even the 'Visual Bookshelf' application on Facebook have been developed to help people "display" their digital book collections. However, given the findings in this study, it seems unlikely such digital visualisations will wholly replace physical book collections, at least in the near future. Designers will need to find ways of hedging against obsolescence, while at the same time creating a more seamless integration between both types of collections, with an emphasis on augmenting rather than replacing.

Current work related to cloud computing may well provide a way forward. While much of the present work in this area centres on pervasive applications and the storage of digital memories (Czerwinski, Gage, Gemmell, Marshall, Pérez-Quiñones, Skeels and Catarci, 2006), industry is also looking at ways of allowing users to store all their digital artefacts and access them whenever and however they want (e.g. Vodafone is investigating such a service). By connecting these digital collections to social networking features, it may be

possible to create an alternate, yet satisfying, way of supporting leisure readers' requirements for ownership, achievement, permanence and value.

This concept of books as social objects was identified in the present study as having an impact on the participants' current leisure reading practices. For example, reading a book in public sends a message in a way that reading on a device does not – a person using the Stanza application on the Apple iPhone could be reading a text message or *War and Peace*. Future devices might offer leisure readers a way to signal they are reading a book, either to connect with others around them or to signal they are less interruptible.

5.6.2 Interaction requirements

At the moment, the content of current devices is encased in a hard cover and presented on a fixed screen. There are very few ways for people to physically interact with them, besides clicking a button. To account for leisure readers' requirements for a more dynamic connection with their reading material, this study suggests future ebook readers must afford more realistic – and malleable – interactions. Recent work by Tajika, Yonezawa and Mitsunaga (2008) on an intuitive page-turning interface for ebook readers that uses flexible e-paper shows promise. However, as with much of the research in the digital reading realm, the focus of attention in their work was on use with a magazine or atlas, not a linear reading experience, i.e. narrative fiction.

The present study suggests the future design of ebook readers will need to encourage mobility (possibly via manipulations of digital text). However, this future work will need to address the requirements of a passive reading experience, not just an active one. The final chapter of this thesis will discuss possible areas for future research that could be used to inform the design of these devices across the two themes of functionality and interaction suggested by this research.

6 CONCLUSION

Ebook readers are here to stay, and there is no doubt they offer benefits, such as a large storage capacity and portability, that are appealing to avid leisure readers. However, as with any technology, whether evolutionary or revolutionary, there is always room for improvement. The present study found that when it comes to key functional properties and desirable opportunities for interaction, today's ebook readers often fall short. To determine how these devices might be improved to meet the needs of leisure readers, there are several areas worth investigating through future research.

Twenty years ago, Dillon, McKnight and Richardson (1988) recommended more research be done to assess the effects of screen size on comprehension of extended texts (i.e. novels). Those recommendations are no less relevant today, especially in light of the new form factors and functionality offered by current digital devices. As smaller devices compete for a share of the ebook reading market, studies might be conducted to ascertain whether the leisure reading experience was more satisfying on a larger, dedicated reading device versus a smaller, more portable one such as an iPhone. This future work could involve quantitative studies designed to measure these factors within a random population sample or within targeted populations, i.e. existing ebook reader users, the elderly or the young.

The findings also suggest several sub-themes that might offer guidance for future work. Of particular interest is the view expressed by several participants regarding the social role of books. New research shows ebook readers have the potential to facilitate readers' desire to share, recommend and rate the books they read (Ganapati, 2009). More study is warranted to

evaluate how well ebook readers support this type of "connected reading" for leisure readers.

In addition, the issue of permanence is one that merits attention. Follow-up communication with Participant 8 suggests she is now "extremely aggravated" by problems related to moving books from her PC to her ebook reader. A longitudinal study that assesses people's ability to access their leisure reading material on ebook readers over time could yield further insights regarding satisfaction levels associated with these devices. Similarly, the role of books in conveying value, a property currently only associated with a physical book, would merit investigation to determine if future technology could accommodate this requirement.

Alongside functional requirements, the present study finds paper-based books afford leisure readers interaction capabilities that current ebook readers do not. The implications of these findings are two-fold. First, leisure readers would appear to be more active than the "passive" label would suggest. Second, this activity is rooted in specific interactions with physical books that many participants felt connected them to their reading experience.

The 'frozen attention' most participants displayed when using the ebook reader does not appear to support such an active leisure reading experience. The participants' fixation and seemingly greater absorption with the device could be attributed to the effect of using it for the first time. However, Participant 8 had been using the device in question for a month at the time of the study and even she did not exhibit any of the physical movements she displayed while reading from the paper book. Following on from the theory put forth by Levy (1997) – that immobility associated with reading from a computer screen can lead to fatigue and possibly decreased attention – future research might be conducted to determine whether decreased physicality

when reading from ebook readers might cause similar instances of fatigue and decreased attention. If such effects were noted, research might also yield insights into whether compensatory strategies for holding and manipulating the device could mitigate these effects in a leisure reading context.

Since the time of this study, a new version of the Sony Reader has been released that offers a touch screen interface (using either fingertips or a stylus). Similarly, applications that support a gestural-based navigation paradigm (e.g. Eucalyptus for the Apple iPhone) have been introduced. These developments signal a move toward accommodating manipulation strategies in the digital book reading experience, and future work is recommended to determine how well these types of interfaces support leisure readers, thereby building on the present research.

The digitisation of books is inevitable, and, most would agree, desirable. However, just as today's teenagers cannot imagine life without the Internet or social networking or a mobile phone, so tomorrow's teenagers may not be able to remember a time when books were simply "tree flakes encased in dead cow" (Mitchell, cited in Birkerts, 1994). Still, given the emotional connection many leisure readers have with their books, as well as the functional and interactive shortcomings of ebook readers that the present study has highlighted, it seems fair to say digital reading devices will not supplant their paper-based predecessors overnight. For now, books and ebooks will need to coexist. It is for future designers to determine whether this coexistence will be peaceful – and satisfying.

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APPENDIX A: CONSENT FORM

Thank you for participating in my thesis project.

I will be recording you as you read and then are interviewed to allow me to review your session and benefit from your feedback.

Participation in this study is voluntary. All information will remain strictly confidential. At no time will your name or any other identification be used. You can withdraw your consent to the experiment and stop participation at any time.

If you have any questions after today, please contact Lisa Moore via email.

Please print your name:

Signature:

Date: _____

APPENDIX B: TIME SPENT READING

Participant number	Book	Ebook reader
1	20	8
2	11	12
3	10	12
4	8.5	7
5	7.5	10
6	8.5	6
7	7.5	7
8	13	8
9	7.5	7
10	5	5
Average	9.85	8.2

APPENDIX C: INTERVIEW QUESTIONS

Reading habits

- Do you read a lot of books?
- How many would you say you read each week/month?
- What types of books do you read most often?
- Do you read one book at a time?
- When do you read?
- Where are you most likely to read?
- What's the next most likely place?
- How long do you spend reading at any one time?
- How do you acquire your books?
- Do you ever buy books that you don't read?
- Do you borrow books from the library?
- Do you share your books?
- How do you save your place in a book?
- Do you write in your books?
- Do you identify books as "yours" in any way?
- Why are books important to you?
- What's your favourite aspect of a book?
- Where do you keep most of your books?
- How do you organise your books?
- Do you ever re-read a book?
- Do you belong to any online social networking sites? If so, do you share book info with those online friends?
- Do you take books with you on holiday? If so, how many?
- Do you tend to buy those books before you travel or do you buy them at the airport?
- If you're reading in a public place, are you ever aware that people are able to see what you're reading?
- How do you feel about this?
- Tell me a little about your other reading materials – magazines, newspapers, etc.
- Do you ever read this kind of material online?
- Do you read onscreen or print and read offline or a combination?
- How do you save articles you want to read again?

Device habits

- Tell me about the device/technology you've identified as your current favourite.
- Why do you like it?
- What don't you like about it?
- How long have you owned this item?
- Do you remember what life was like before you had this item?
- What would you do if you couldn't use this item anymore?

- Do you have an MP3 player?
- (If yes...)
- How do you buy music for the device?
- Do you ever buy the physical CD as well as download the MP3?
- Did you duplicate items in your physical collection with digital versions?

- Do you have a digital camera?
- (If yes...)
- How do you share the photos you take?
- Has being able to share photos digitally made access to physical photos more or less important?

Ebook reader experience

- Which book reading experience did you enjoy more and why?
- Tell me what you liked about using the ebook reader.
- What didn't you like? And why?
- How did you find the reading experience with an ebook reader different than with a book?
- What did you think you would think of the ebook reader before you tried it?
- What do you think this device does better than a paper-based books? And vice versa...
- Thinking about the way you currently read your fiction books, would you expect a device like this to change those habits at all?
- Is this a device you might buy?
- Would you use it if someone gave it to you?
- What would be the most significant factor in your decision to buy such a device?
- How important would it be for you to own the physical version of a book you had downloaded onto the device?
- If you were in public, would you want people to know which book you were reading?
- How important would it be for you to be able to read other types of documents, i.e., magazines and newspapers, on this device?
- Would you expect the device to have other functionality? If so, what?
- Can you imagine feeling the same way about this device as you currently do toward your X piece of technology?

APPENDIX D: THEMATIC CODES

Code list with descriptions and sample quotes from participants.

NAME OF CODE	DESCRIPTION	EXAMPLE
Location/ context	Place where reading generally took place	"I always read in bed." P8
Length of time	Time spent reading	"I read, like, a chapter and then I go to sleep." P1
Acquisition	How they choose books – at shop/online – what criteria influences decision to buy or borrow a book	"I buy them from a bookshop. Or get them as gifts." P2
Sharing	Giving to others	"People lend to me and I have a circle of friends and the books tend to go around." P7
Companionship	On trip or Tube or waiting for someone	"I take a book with me whenever I go out." – P4
Saving place in book	Turn down corner, bookmark or other	"I fold the corner down but if I like something, I'll fold the page over, as well." P9
Respect/ reverence	View of books	"I remember I had this really Christian teacher once who told me that books should be treated like you'd treat yourself or the Bible. But books are meant to be your own – you can bend it and stuff." P6
Weight/ importance/ depth	What books represent	"There's more depth and enjoyment with books than there is in watching TV or a film." P7
Active role	What is required of them when reading	"Being the reader, you have to contribute part of (the) vision and so your own understanding goes into it. Also, you're so much more in communication with the author's ideas, not just the story, you know? It just engages your mind so much more." – P1
Connection with author	Connecting to author's thoughts via book content	"I can lose myself in it, especially the writers. My opinion can be changed by a book." P7
Unique experience	Different from other media	"It's such a different thing than television or something. I don't know. They do just hold so much more weight in a way of your mental life and are just a way to escape." P1
Mental image	What content conveys – makes them think about, visualising scene in book	"I really enjoy that – it's really interesting to get the transition from reading something to picturing something." P9

Engagement	Connecting with reading experience	"My favourite aspect of a book is when you're in a good story and you don't want to put it down." P8
Emotions	What book conjures up for them	"It's paper, it's emotional, it's what I'm used to." P
Escapism	Why books used	"You don't want the possibility of being interrupted or having the rest of the world around you because then it takes away from the escapism of a book." P8
Typeface	Physical quality that appeals	"I tend to pick books that have small type. I like that but it's probably not good for my eyes." P9
Ownership/possession	How they think about current physical books – what it means to own book	"I'd feel a book was more mine if I owned a physical copy of it." P6
Organising	How they physically sort books – alphabetically, thematically, etc	"I keep them in the living room mostly, on shelves and they're grouped by subject, on the whole." P2
Book collection	How they keep books – on shelf, personal library, etc	"The best thing you can build up is a library because you'll always have it." – P6
Re-reading	A book they've already read or within a book	"Some of my favourite books I've probably read 10-12 times." P7
Social	What books represent – talking with others about books, groups, etc	"(Books) are a particularly satisfying thing to talk about with other people. [...] It's something pleasurable and kind of completely different to talking about things that seem more commonplace to talk about – it's more interesting talking about books." – P5
Satisfaction	From reading	(On device) "I like the way the page number changes. It's quite satisfying to be able to read a page very quickly." P9
Embarrassment	Reading a specific type of book in public, being seeing reading	"You might be embarrassed about the book if you have Jilly Copper's Imogen from the '80s. You wouldn't want anyone to see you pull that out of your bag." P6
Customising/personalising	Write name in book or mark in other ways	"I like worn out books rather than newer ones – I like it more when I've battered a book." P5
Physicality	Physically doing things to books	"I like it when you mess up books because then I feel like I've read them properly." P9
Flexibility	Being able to determine when/where to read	"I often don't want to be attached to the computer to read. So it makes it more flexible to do it in my own time and place." P8

Convenience	Easy to take with them, easy to access	(Other devices) "With an iPod, you don't have to change the record over, you can just flick through it." P7
Portability	Easy to carry	"What this would allow you to do would be to carry a variety of different books around with you... There are times when if you only have a 10-minute interlude, you might read something like a short story or piece of poetry because you know it's hardly worth getting into reading something longer." P4
Attention	Paying attention to what's being read	"I need to be able to pay attention otherwise I don't think there's any point in reading." P9
Availability	Having access to a book	"With the ebook reader, gone is the fear that I might run out of a book and then have to worry where would I get the next one from?" P8
Worth/value	Quality of a book – coffee table book, book as gift, physical book vs digital	"I'd always want to have the book, especially certain types of books like classics or coffee table books." P6
Objectness	Book as object	"It's just that books are nice as an object." P5
Awareness/signalling	While reading – of others watching them or watching what others read	"I've looked at people and thought they were a cool person because of the book they were reading." P5
Multitasking	Device doing many things	"I'd much rather have something simple that did one thing unbelievably well [...] This should be for reading." – P4
Singularity/standalone	Device doing one thing – preference for one device	"I quite like the idea it just serves its purpose." P6
Tactile/ tangible	Quality of book	"You're constantly in touch with the physical object whilst you're reading." P5
Permanence	Ability to return to book, keeping a book	"I'd feel a book was more mine if I owned a physical copy... The best thing you can build up is a library because you'll always have it." – P6
Reassurance	Comfort derived from having book	"I feel better about myself I guess because I've got them and I can always look at them if I want." P6
Data loss	Losing data on a device	"I've lived with the children's grief when their iPods have died and they've been unable to recover their music, and the idea of that happening with books is just too sad." – P4

Temporality	How long it will last	"It's more temporal than a book, isn't it?" P9
Obsolescence	How long it will last	"This wouldn't last forever – it could just break." P9
Contrast	Of device display	"I was quite pleasantly surprised that it wasn't like a computer screen, like, tiring on the eyes. It was quite matte – like a page matte." – P5
Page transition	On device	"I've seen this before on other similar devices so it wasn't a surprise but it is distracting. The reason it's distracting is because it breaks your concentration – in a story you have a mental image of a piece of text it's kind of abstract in your mind you fill in the blanks. The black and white transition kind of interrupts that continuous experience." P3
Multiple devices	Carrying several digital devices	"I wouldn't mind carrying separate devices. I carry three or four already. This would just be another one." P6
Interruption	Caused by device – email arriving, etc	"If you're reading a book, you're reading a book. I don't really like things to take my mind off it." P10
Power	What book represents	"I think the content of some books doesn't occur in other media – some niche kind of things some very powerful and useful things. Whether that's helping you become more org or fix your bicycle – they're very powerful aspects that can help you become better." P3
Affordability	Cost of device and content	"I'd buy this, depending on the price. I think I'd wait for the price to come down." P7
Duplication	Having same book in physical and digital format	"If I really wanted to re-read something and the technology had gone, I'd either re-buy it or go buy the physical copy." P8
Comforting	Quality of books	"It's something I maybe read when I was younger and I enjoyed it and it's become a staple." – P4
Visual	Seeing the book/pages	"It's more about having a collection of pages getting larger here (indicates left side of book) and one getting smaller here (indicates right side), rather than being aware of how many pages I've necessarily read in numerical terms." – P10

Effort	Forcing self to read	"I find I have to make myself read I'm not one of those people who can just go through a book like that (flips book pages) – I have to really work at it." P6
Concentration	How absorbed in reading experience	"That's one of the benefits of not having to turn a page, it stops your concentration being broken." P5
Accomplishment	Proud of self for reading/finishing books	"Once I've read it, I just feel proud of myself when I've finished one." P6
Display	Device screen	"I think this is easier, I think it's the smaller pages. It's less intimidating." P6
Navigation	Moving through book – flipping to back, endnotes	"I often flip back and refer to the back cover quite a bit when I'm reading." P8

