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How do we Read Online:

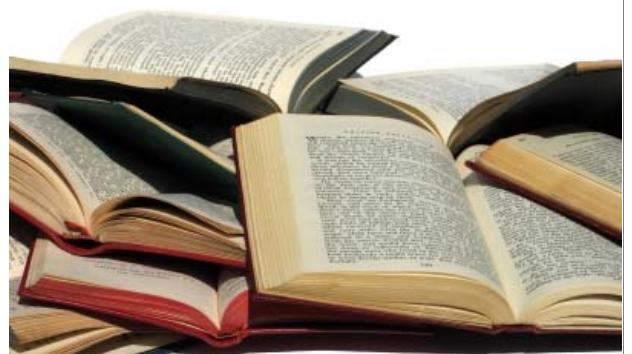
The effect of the Internet on reading behaviour

By

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It is not the reading of many books which is necessary to make a man wise or good;
but well reading of a few.

~ Richard Baxter ~

Abstract

Purpose

The purpose of this study is to explore online and offline reading and determine the differences between them while assessing the impact of the Internet and online environment on individuals' reading behaviour.

Design/methodology/approach

This study followed a sequential mixed-method approach and employed both qualitative and quantitative research methods. First, two focus groups were carried out to obtain a range of opinions on the topic and identify unforeseen areas. Subsequently, an online survey was applied to a representative sample of individuals from multiple countries.

Findings

People used different media for different purposes. They read a range of paper materials throughout the day in various locations to gain knowledge, for pleasure, for mood change, to escape, and out of obligation. They also read a range of online materials due to the availability of a large choice, efficiency, accessibility, low cost, up-to-date nature, and environmental considerations. The different media revealed different reading patterns. With an increasing amount of time spent on reading online, a screen based reading behaviour is emerging. Skim reading, scanning, and speed reading were evident while less time was spent on in depth reading leading to less comprehension and content absorption/recall levels. There was a lower attention span on online materials therefore less concentration was also identified. Reduced relaxation levels were evident therefore the majority of individuals printed online materials to read. Overall, the amount people read had increased over time due to the vast amount of reading materials.

Research limitations/ implications

Online reading strategies and skills are required to address the identified impacts. Future research can be extended to more scientific evidence to justify these findings. It would also be fascinating to examine how new additions to online reading devices influence or alter the online reading behaviour.

Originality/value

One of the few studies that analyses the impact of the online environment on individuals' reading behaviour. In this sense, it provides a significant contribution to both academic literature and practitioners.

Keywords

Reading, Behaviour, Online reading, Internet, Online materials, Print materials, Comprehension, Concentration, Content absorption, Content recall

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1. Introduction

Technological advancements and the Internet have altered conceptions of certain activities and businesses (Cheong & Park, 2005). Universities and schools offer more online classes; news corporations provide online newspapers; and publishers release more online books and journals. As a result, the amount of text based information available online is steadily increasing. People use the Internet to seek information, read news, to communicate, and for entertainment purposes. Statistics indicate that the number of people accessing the Internet is increasing (Internet World Stats, 2009) and especially the younger generations are using more online media (Chu, 2003). Many university libraries are reporting a decline in the usage of print journals and magazines as more readers access the full text articles online (De Groote & Dorsch, 2001).

Reading on screen is indeed different to reading on paper. Each medium provides its own benefits. Research into reader experience on paper vs. online resources indicates variances in user perception. The literature on reading on the Internet and digital media presents many positive impacts such as enhanced user experience through media rich content, efficiency, increased reading capacity, flexibility, cost effectiveness, and comprehension, (Fidler, 2004; McPherson, 2005) as well as negative aspects such as impact on short and long term memory, lack of concentration, lack of comprehension, inability of annotation, and lack of portability (Carr, 2009; Leu & Zawilinski, 2007).

In view of the development of online materials, there has been growing academic interest in research focusing on reading in the digital environment particularly observing how people read online. However, limited research has been conducted to assess the changes to human reading behavior in the online environment (Liu, 2005). In this context, the aim of this paper is to research both offline and online reading and determine the impact of online environment on people's reading behaviour. As argued by Carr (2009) the impact of the Internet and online reading may have affected and altered individuals' reading patterns. Thus, the research objectives are set to explore: [i] the online reading behaviour of individuals, [ii] to determine underlying patterns, [iii] explore offline reading behaviours, [iv] and to determine the differences between online and offline reading, [v] and the type of impact of the online environment on that.

The scope of this research project is set to examine the reading behaviour on online and offline materials in general rather than focusing on specific types of material. The study will be conducted as an exploratory research in order to obtain a holistic view of the topic. Emails and their impact are excluded in this study as the topic is large enough to conduct a separate research on itself.

This research report is structured as follows. The next section contains a comprehensive literature review that covers the history of reading, the costs vs. benefits of online and paper based materials, findings from various research studies on reading behaviour, and arguments by both academics and practitioners on online and offline reading. The subsequent section consists of a detailed description of the research methodologies used for this empirical investigation. Findings are reported next, and are separately presented for each phase of the data collection. A discussion section follows next with a detailed analysis of the empirical data that was collected during the data collection phase. Finally, the report concludes with an indication of the major findings of this study, any implications, and possible future research directions.

2. Literature Review

What is reading? Reading is not merely the attaching of sound to grapheme. It involves meaning in a fundamental way. At a higher level of perception reading can even convey meaning alone, without any recourse to sound. In its most general and modern definition reading is “the ability to make sense of written or printed symbols” (Fisher, 2004, p.11).

Since early civilizations, humans have learnt to read and write in order to communicate with each other. We read and write with the purpose of knowing each other’s responses and to connect ourselves with the human world (DeMott, 1990). Studies into human reading behaviour have been conducted for a considerably long time. Stock (2008) states that the study of reading is considerably older than the writing of literary history and is not grounded in any single period, doctrine, or ideological position. Looking back into the past, Sumerians in southern Mesopotamia have been cited as the world’s first active readers and writers. The concept of reading and writing had then spread to the other civilizations such as the Indus and Chinese. Schramm (1988) documents that it took at least 50 million years for society to progress from spoken language to writing; about 5000 years from writing to printing; about 500 years from printing to the development of sight-sound media such as telephone, radio, and television; and yet fewer than 50 years from the first of the sight-sound media to the modern computer.

With the first page printed in Germany in 1450 (Fisher, 2004), not only reading has been transformed, but it has also transformed society. The printed page proceeded to influence nearly every aspect of life. Today we are used to seeing printed writing in nearly every imaginable circumstance, newspapers, books, street signs, product labels, and advertisements. Printed words on paper were economical to reproduce compared to hand written parchments, and therefore mass production of printed books became common in the 18th century (Fisher, 2004). These commonalities led society to read more, question and think more, and seek more information for themselves. Stock (2008) affirms that the range of every type of reading and interpretation was extended after the invention of printing. Indeed, printing’s emancipation of the written word defined that essential dynamic of our modern world, the accelerated accessing of information.

According to Fisher (2004), in 1750 there were only ten scientific, technical, and review journals in the United States. Fifty years later it has grown to ten times this number, and by the following fifty years it has expanded ten times more. By 1950 the number had grown to one hundred thousand titles. From then until 2000, the total number of US titles has grown to a half a million and continues to rise exponentially. Price (1986) pointed out that the number of scientific journals has doubled about every 15 years since 1750. Fischer (2004) identifies this as an information pandemic which is the result of multiplication, diversification, proliferation, and acceleration of written matter.

One reason for the increasing number of publications is the fact that during the last millennia the world's population has also grown exponentially. Estimates of the world population in 6500 B.C ranged from five to ten million people. By 1 A.D., the population had grown to 300 million. It reached 1 billion in 1804, and 2 billion 123 years later. The next billion was added within 33 years, and five billion was reached in 1987 (United Nations, 1999). The Central Intelligence Agency (CIA) (2009) estimated the population to be 6.7 billion by the end of year 2009.

Historical data show that global production has grown systematically faster than the global population. This means that humans have been able to increase their effectiveness and efficiency in producing goods and services. The speed of growth accelerated after the 15th century, increased impressively during the 19th century, and skyrocketed in the 20th century (Tuomi, 2003). Knowledge, technological progression and especially the introduction of the Internet in the 20th century have clearly been important factors in this process of increasing media at an unprecedented pace. As a result, the range of media proliferated from printed books, newspapers, and magazines to online digital material such as electronic books, digital newspapers, online journals, web pages, wikis, and blogs.

Global Internet statistics show that 1.74 billion of the world's population has access to the Internet today. The usage growth has been 380% over the past decade. In 2005, worldwide Internet usage reached and surpassed one billion people, one sixth of the world's population (InternetWorldStats, 2009). Most of this growth has taken place in the past five years (de Argaez, 2006). At this rate, it is estimated that nearly half of the world's population will be reading online by 2014. Smith et al. - World Internet Project New Zealand (2009) reported that 83% of New Zealanders use the Internet. The project report further states that the Internet

is rated highly as a source of information above all the other sources surveyed. New Zealanders spend considerable time using the Internet to find different kinds of information. Out of all people surveyed, 63% went online at least weekly to read local, national or international news while 21% read travel information and 21% read health related materials (Smith et al., 2009). A survey of 4000 randomly sampled U.S. households found that almost 70% of the respondents reported reading as the fourth most popular Internet activity (Stanford, 2000). Curtis (2009) found 'screen time' including browsing and reading on the Internet has become so pervasive in the daily lives of five- to 16-year-olds in the U.K.

Reading is not a skill that we are born with. It is a skill that we learn over time similar to learning to speak a different language. According to the Transaction Theory, a person interacts with reading content like a river connects with its banks, each working its effects upon the other (Rosenblatt, 1986, 1994; Rosenberg, 1996). Therefore, the behaviour and the materials have evolved with the effect from each other. Academics, especially the researchers who work on areas of cognition and brain power, have been extremely interested in the study of how humans process information. One of the primary areas studied is the human memory. Atkinson and Shiffrin (1968) presented the Staged Model of Information Processing explaining how information get processed and stored within human memory. The key element of this model is that it views learning and memory as discontinuous and multi-staged. The authors argue that the information that is taken in (e.g. via reading, listening) some way gets manipulated before being stored in the long term memory, but some information gets forgotten.

Ross (2003) suggests that we need to pay more attention to how readers actually engage with different media, their reasons for choosing one format over another, and their satisfaction with each format. Digital media are different from print reading materials. McEneaney (2006) stated that users picture online documents as networks of nodes and links. This requires that readers define text structure by choosing links, which are based on readers' internal knowledge structure rather than on an author-defined text structure (McEneaney, 2003, 2006; Rosenberg, 1996).

With the growing amount of digital information available and increasing amount of time that people spend reading digital media, the electronic environment has begun to affect people's reading patterns and behaviour. Studies into digital media and its effect on human reading

behaviours present mixed conclusions. While some researchers have identified powerful advantages of digital media which are absent in paper materials, others have criticised the effect of the internet on human cognition and reading capabilities. The challenge is to determine the applicability of a particular medium in a given context or for a process.

One of the salient positive characteristics that have been identified about online material is the efficiency that it delivers over its counterpart on paper (Shaikh, 2004). The ability to embed multimedia in reading content, interactivity, ability to search the content, and better information structures are identified as other key benefits of the digital media (McPherson, 2005; Ross, 2003). Many studies show that online reading and reading on the web is a sophisticated reading experience because readers must process the information in so many different forms such as photos, audios, videos, charts, and graphs. Findings from an exploratory study on literacy learning on the Internet (McNabb, Hassel, & Steiner, 2002) reveal that Internet-based learning activities make reading enjoyable, foster the use of critical reading skills, and promote reading fluency.

Reinking (1992) states that the use of hyperlinks in online content encourages students to have more control on their reading and be engaged with the content. The amount of information that readers can access online is also unlimited. Hyperlinks can guide readers to information that is relevant to what they read. This creates an enriched reading experience by allowing the reader to obtain necessary background information (Fidler, 2004; Moje & Pugh, 2009).

By demonstrating examples from the Online Literary Anthology of Brown University in North Carolina, Fidler (2004) argues that electronic text provides a more efficient way to assist language students, especially beginner students, to read text that contains a multitude of unfamiliar words by using sound files. Each reader also has the flexibility to decide how they will read the text, whether it be a global reading of the text, a detailed reading of each sentence, or an analysis of the literary associations in the text, and choose annotations accordingly. The availability of one or more entry points to the same page, especially if the link is considered important, also encourages users to access the same information through different paths at different phases of reading.

Fidler (2004) argues that digital media provides the freedom to read and choose annotations which leads to better comprehension. The comprehension of a text can be combined with listening activities, especially in the area of language study. The author affirms that electronic material on the web may have the potential to bring students to a higher level of reading comprehension more quickly than traditional printed texts.

The potential audience of the Internet is also far greater than those who read printed materials. This audience includes people with range of education, industry, and cultural backgrounds including people with special needs. Liu (2005) states that digital media also has the potential to enhance the ability to make information more suitable to targeted recipients such as persons with disabilities. Technological innovations such as screen readers and special web browsers make it easier for users with disabilities to access online materials. Whether people prefer digital media or not, reading and literacy are being redefined by the arrival of these new technologies.

In contrast, a number of scholars argue that online media has its disadvantages which impact human reading behaviour.

McPherson (2005) argues that hyperlinks distract readers. Hyperlinks in online content may encourage users to navigate away from a resource and drift focus so they end up reading content that was not relevant to their original topic. Healey (1990) and Birkerts (1994) argue that the fragmentary nature of hypertext is threatening sustained reading. Advertising on web pages distract the reader and have ethical implications. Some of these may contain untrue claims and advertiser bias. Even pop-up adverts on web pages are considered as unethical because they distract the readers.

Readability on the web has also been seen as poor as opposed to reading on paper. Moje and Pugh (2009) states that;

“Reading is an activity that requires focused attention for an extended period of time. When you read a narrative, you create pictures in your mind to go along with the story. So reading books is a mentally stimulating activity. It's good for the brain. But a lot of the reading that we do online is not the same sustained, focused reading that we do when we read narratives. If you spend most of your time online, not really exploring

texts or staying on topic for an extended period of time, then you're not getting the full benefit of reading” (p.1).

Acknowledging the above concern, Birkerts (1994) further notes that generations growing up in the digital environment lack the ability to read deeply and to sustain a prolonged engagement in reading. Evidence suggests that these individuals are looking for small chunks of text and shorter paragraphs. Carr (2008) argues that online reading has decreased users' capacity to concentrate and contemplate, and engage with information resources.

Although improved comprehension has been identified as a positive outcome of digital material, findings from Fidler (2004) exemplify students revealing a passive approach to reading in the online environment. Burke (2000) found when individuals are using the Internet, scanning through lists generated by search engines, they become ruthless and restless to determine if they have the required information that they were seeking for.

By far the most common experimental finding is the discomfort and slowness of reading on screen. Chu (2003) states that people generally find it uncomfortable and do not prefer to read books on screen. Slower reading speeds and increased fatigue have been noted as other factors that discourage reading online articles (Shaikh, 2004). Hartzell (2002) also notes that reading speed from a monitor is up to 30 percent slower than reading the same text on a printed page. Document portability, the ability to highlight, and the ability to retain the original formatting, are other disadvantages for online materials as opposed to the printed media (Shaikh, 2004). Empirical data from Liu and Huang (2007) illustrate that people prefer reading on paper where there is a need for reading lengthy documents, in-depth reading, and taking notes.

Various empirical studies have been conducted into human reading patterns in the online environment. Major emphasis has been placed on human eye movements during browsing and reading online material (Outing & Ruel, 2004; Kliegl & Engbert, 2005). The findings from these studies help website owners and marketers to produce effective web content and layouts. Eyetrack iii, a joint project of the Poynter Institute, Estlow International Centre for New Media and Journalism at the University of Denver, and Eyetools California based eye tracking software and service company have produced interesting findings about the online reading patterns. The results from the study revealed that dominant headlines catch reader's

attention and the use of large text sizes encourage greater scanning of content. Having the same size text for the headlines and the description text, has revealed better response from the readers where having a separate headline with a larger text encouraged readers to scan the line and ignore the description text. Underlined text has created visual breaks which discouraged readers from proceeding to the text below. Shorter paragraphs have performed better than long paragraphs in encouraging focused viewing behaviour.

Despite the apparent increase in online reading, many users report printing online material to read on paper (Rho & Gedeon, 2000; Shaikhe, 2004; Liu & Huang, 2007). A survey into reading activities on online academic articles by Rho and Gedeon (2000) reported that the readers 'overview' the web based academic articles from the screen but print them out to read. Similarly, McKnight (1997) suggests people do not like to read on screen, rather they print them out for reading - even printouts from dot matrix printers. He argues that the recent trend of publishing electronic documents in portable document format (PDF) encourages people to print rather than read on screen. Shaikh and Chaparro (2004) evaluated the reading preferences of the Internet users across five document types and concluded that respondents preferred to read longer documents such as journal articles on printed form while news or product information onscreen.

The recent development of the Internet and benefits of the digital media have affected how some businesses operate. Newspaper publishing is one of the industries that has been more affected by the development of the Internet. According to the 8th annual Survey of Digital Future project conducted by the University of Southern California (2009), Internet users report a large increase in time spent reading online newspapers. Empirical data from Shaikh and Chaparro (2004) suggest 62% of respondents preferred to read news on screen rather than on paper. Research indicates that the number of online newsreaders is increasing while the traditional print newspaper publishing is significantly decreasing (Zarwan, 2006). Moreover, digital newspapers are among the services most sought by Internet users (Consoli, 1997; Levins, 1998). Kaye and Johnson (2004) state that the main aim of accessing the Internet is to read breaking news, read up-to-the minute information which is only exceeded by the use of email. The appearance of the new digital media as opposed to the printed media has implied important changes in this sector (Bush & Gilbert, 2002). This also includes noticeable implications on how newspaper readers read news online. Flavian & Gurrea (2007) states usability, reputation, trust, familiarity, and privacy as key factors that affect the reading of

digital media online. Reputation and trust can be seen as key factors for offline newspaper readers to change their mindset so that they trust the information available online. Reputation of the news organisation plays a key role in order to attract the readers to their online news pages.

With the growing amount of digital information available and the increasing amount of time that people spend reading electronic media, the digital environment has begun to affect people's reading behaviour. Recently introduced formats, such as online episodes/chapters of Internet-published books, or PDF files of articles and books have accustomed readers to viewing pages electronically (Du, 2010). Some people are already beginning to sense the impact of the Internet and digital information on their reading behaviour.

Comments from Carr (2008) raises significant reservations on how the Internet has altered our memory and concentration capabilities and reading patterns. The author makes a compelling argument that the Internet might have detrimental effects on cognition that diminish the capacity for concentration and contemplation by using his own experiences and anecdotes from acquaintances.

A study of online research habits conducted by scholars from the University College London (2008), suggests that we may well be in the midst of a sea change in the way we read and think. The research team found that people are not reading online in the traditional sense while they tend to skim read, hop from one source to another, and "power browse" exhibiting new forms of reading patterns. Wolf (2007) believes that the 'reading brain', formed over the past 5,000 years since the acquisition of reading, is being endangered - an unforeseen consequences of the transition to a digital age that is affecting every aspect of our lives.

The impact of online media has increasingly been the subject of empirical and theoretical exploration by many researchers from a wide range of disciplines, notably psychology, education, and library and information science. However, researchers are at a very early stage in terms of discovering the impact of online reading on human reading behaviour. Liu (2005) researched how people's reading behaviour has changed over the past ten years. The findings suggest that digital media may have changed regular users' reading behaviors by increasing browsing and scanning, increasing on-time reading, and decreasing in-depth and sustained reading (Liu, 2005). However, this study is limited to the US experience and a convenience

sample belonging to age group 30-45. Therefore, it is difficult to discern whether the findings from this study are applicable in other cultures. Moreover, different age groups may present different viewpoints in terms of the effect of the Internet and online reading on their reading behaviour. Due to continuous adoption of the Internet and online reading, findings from a 2005 study also need to be revalidated.

3. Methodology

The online environment has begun to affect how people read. Much previous research has attempted to explore reading in the online environment by examining the evolution of reading, observing how people read electronic documents, analysing their eye movements, and evaluating the benefits vs. costs of using online and paper materials. While these approaches are useful in discovering how people read, they are limited in providing insight into the impact of online material on people's overall reading behaviour. For example, research into the evolution of reading allows us to comprehend the changes in reading from an historical perspective, but is limited in providing us with detailed information on how reading activities are actually changing. Observing people's reading approach gives us a detailed analysis and description of how people actually read but fails to provide a broad picture of how the online environment changes human reading behaviour. Cost vs. benefit analysis provides only why people may choose either paper or online reading materials.

The exponential information growth and the Internet adoption rate within last five years may have altered the nature of impact on people's reading behaviour. Only a few studies have explored the fundamental issue of the Internet's impact on reading behaviour. Researchers are only at the very early stage of discovering changes in reading patterns (Liu, 2005). It is important to validate the findings from this 2005 study to see how much they apply to readers today. Therefore, this study aimed to explore reading in the online environment from a different perspective. Instead of observing how people read online material, this study attempted to investigate what impact the Internet may have had on people's reading behaviour.

For the purpose of this study, online material included material that people read on screen while on or off the Internet such as web pages, blog posts, online journals, online newspapers, downloaded online material such as electronic journals, and other such documents. Since this study was dependent on participants having an accurate recollection of their overall reading habits, careful attention was paid to the adequacy of long term memories in the design of questions for both focus groups and the online survey. People were asked to report general changes to their reading patterns rather than requesting to report detailed changes since it seemed unrealistic to expect them to remember particulars accurately.

However, in both phases participants were provided with the opportunity to express any specific details they wished to contribute.

The amount of time spent on reading varies widely among different age and cultural groups. Since the purpose of this study was to explore the impact of the Internet on reading behaviour, an attempt was made to select people with extensive experience in reading online material. The study was focused on people over 18. Both phases included a mixture of participants from several countries, cultural groups, gender and age groups.

The overall study was conducted in two phases. It employed both the interpretivist and the positivist research paradigms. The interpretivist paradigm was chosen because it allowed understanding people's interpretation of things and the human behaviour within it (Pickard, 2007; Walliman, 2006). This was deemed appropriate for this research as it helped understanding interpretation of people's perceptions on the topic which are influenced by preconceptions and their beliefs. In this research paradigm, the researcher is inextricably bound into the human situation unlike the natural sciences, where the researcher is observing the phenomena from outside (Walliman, 2006). In acceptance of the use of this concept, Phase 1 of this study consisted focus groups, a qualitative research technique, to explore the online and offline reading behaviour and obtain a variety of opinions and perspectives.

The positivism philosophical paradigm is based on realism, an attempt to find out about one real world (Walliman, 2006). Positivist approach is extensively valuable in predictions, explanations, and framing of general laws (Pickard, 2007). Therefore, positivist approach was also chosen as it allowed empirical testing and generalising the findings from Phase 1 of the study. This was considered to be necessary as the sample size for focus groups might be too small to demonstrate validity of the findings. In doing so, an online survey, predominantly a qualitative technique, was employed as Phase 2 of the study. It was primarily aimed as a confirmatory activity for the Phase 1 as well as to obtain additional findings which were not revealed. An online survey can be freely delivered to a larger audience in global scale who uses the Internet, therefore read online. Details on the data collection methods are presented within Phase 1 and Phase 2 sections of the report.

4. Phase 1

4.1. Data Collection

“The focus group method is a research technique that collects information through group interaction on a topic determined by the researcher” (Cavana, Delahaye, & Sekaran, 2001, p.153). This technique has been used in qualitative social research since the late 1930s (Kreuger, 1988).

In the focus group, the researcher acts as a mediator between the questions and the group, and between the individual members of the group. The researcher’s interest maintains the focus while the information comes from the group’s interactions. As focus groups allow a variety of perspectives and explanations to be obtained from a single data-gathering session, they are becoming increasingly popular in qualitative research as a means of gathering data from a number of sources at the same time (Pickard, 2007). The major driver behind selecting the focus groups technique was the group dynamics and synergies that take place within a group discussion environment and in particular the hidden and unconscious motives behind group interactions. The existence of interaction allows exchange refinement and re-evaluation of views. Morgan (1997) points out that the focus group method provides direct and immediate evidence about similarities and differences in participants’ opinions and experiences, as opposed to reaching such conclusions from post hoc analysis of separate individual interviews.

As for the Phase 1 of the data collection, two focus groups were carried out in early February 2010. Convenience samples were chosen for both focus groups. The first focus group comprised six participants and the second group consisted of seven members excluding the researcher who acted as the facilitator. The samples were chosen and grouped logically based on the age of the participants, and the level of experience with reading materials to achieve a good symmetry. It was anticipated that by consolidating similar ages and experiences, participants would complement each other’s opinions, creating synergy that helps to explore the depths of the topic while bringing a diversity of interests. In both instances, the participants were invited via an electronic meeting invitation (MS Outlook calendar entry) to participate in the focus group. The invitation included an electronic copy of an information

sheet and a consent form which participants printed, signed, and returned to the researcher prior to the time when the relevant focus group was held. (See appendix 9.1.1 for information sheet and 9.1.2 for consent form). The information sheet contained information about the research, its benefits, and strategies to protect participants' privacy and confidentiality. The information sheet also included the instructions on how to withdraw from the study and the means of contacting the researcher and his supervisor for any further enquiries. Due to the electronic meeting invitation participants had the ability of knowing who else was invited to participate in the focus group. This enabled participants to be comfortable, enable potential preliminary discussions on the topic, and potentially save time at the beginning of each focus group on entry level rituals and 'pass-time'. In addition to the first invitee list, further invitations were sent out until the required numbers of respondents were reached.

4.1.1. Focus Group 1

The first focus group was conducted in the first week of February 2010. The group consisted of six participants. This group comprised both male and female participants aged over 30. All members were currently in paid employment, some with managerial experience, and all with extensive exposure and experience with paper materials. All participants has been significantly exposed to online reading materials. The majority of the participants had years of experience in paper based material prior to the Internet boom and the exponential growth of digital material in last two decades. The group comprised participants who were working in the library, records management, web publishing, and information management areas. Although the participants were from New Zealand, some members had recently migrated to the country therefore had the potential for different views and opinions about online reading based on their experiences overseas. Table 1 below illustrates the summary of the participants.

Table 1 - Summary of participants - Focus group 1

Participant	Position	Age	Gender	Nationality
A ₁	Records Manager	50+	Female	United Kingdom
B ₁	Staff Trainer	40-49	Female	New Zealand
C ₁	Records Advisor	30-39	Female	New Zealand
D ₁	Web Manager	50+	Male	New Zealand
E ₁	Librarian	40-49	Female	New Zealand
F ₁	Web Team Leader	50+	Female	United States

4.1.2. Focus Group 2

The second focus group was conducted in the second week of February 2010. This group consisted of seven individuals aged 30 or under. The participants were primarily exposed to online materials and used them for study and/or work purposes. They were also experienced in using paper materials but being a younger generation, they tended to be more familiar with the digital media and electronic gadgets. This group consisted of current tertiary education students as well as young people in paid employment. The participants were selected from the researcher's work colleagues and students from the Victoria University School of Information Management. Close attention was paid in selecting the participants in order to obtain a mix of nationalities, work, and study backgrounds. It was expected that this group composition would enable a good diversity of perspectives. Table 2 below illustrates the summary of the participants.

Table 2 - Summary of participants - Focus group 2

Participant	Position	Age	Gender	Nationality
A ₂	Records Advisor	30-39	Male	New Zealand
B ₂	Web Administrator	18-29	Female	New Zealand
C ₂	Software Programmer	18-29	Male	Czech
D ₂	Tertiary Education Student	18-29	Male	Indian
E ₂	Web Content Editor	30-39	Female	German
F ₂	Tertiary Education Student	18-29	Female	Chinese
G ₂	Software Programmer	18-29	Male	Indian

Both focus group discussions were semi-structured. The discussions were governed by a predetermined set of questions which were provided to the participants at the beginning of each session. This was intended to avoid any misinterpretation that might occur if the questions were presented orally. As the discussion progressed, more questions were asked by the facilitator where required. The questions were categorised into three major areas: reading on paper, reading online, and comparison of online and paper materials. By logically grouping the questions, it was expected to maintain participants' focus on each medium and obtain rich data on each type of material.

The first group of questions were mainly focused on participants' experience in reading on paper materials. The questions were designed to capture a wide range of information by querying on what, when, why, where, and how they read the paper based materials. The second group of questions were mainly focused on participants' experience in reading online materials. Online materials included digital material people would read while on or off the Internet such as web pages, digital news papers, electronic journals, and e-books. Questions from the third section were focused on obtaining a comparison from participants on their experience with both paper and online materials. All the questions were open ended allowing the participants to provide as much detail they wanted: "Open ended questions provide no indication of possible answers and rarely define any parameters to restrict the respondent" (Pickard, 2007, p.194). Pickard (2007) also states that the descriptive data that open ended questions may produce can often bring a totally new perspective to an issue, one even the researcher had not considered. Therefore, these questions provide the focus group participants with an opportunity to make their own comments about an issue, to express precisely what was important to them about this topic. (See appendix 9.1.3 for full list of questions).

Both focus groups were video recorded and the audio parts were transcribed by the researcher for analysis. Using audio or video recording devices can preserve a range of details and be a significant memory aid during the analytical stage (Cavana, Delahaye, & Sekaran, 2001). The ideas offered by each group were written in a white board by the facilitator. These notes reward the participants by showing their ideas are accepted, encourage their participation, and generate new ideas. Observational notes were also taken during each focus group session by the facilitator. Refreshments were provided to the focus group participants prior to the beginning of each session.

At the conclusion of the focus groups, qualitative data analysis was conducted. Qualitative analysis is usually applied to studies that focus on emerging theory, using an inductive analysis process to arrive at an understanding of the phenomenon under investigation (Pickard, 2007). Morse (1997) believes that the process of qualitative analysis involves:

- Comprehending the phenomenon under study
- Synthesising a portrait of the phenomenon that accounts for relations and links within its aspects
- Theorising about how and why these relations appear as they do
- Re-contextualising or putting the new knowledge about phenomena and relations back into the context of how others have articulated the evolving knowledge.

An independent content analysis was conducted on the responses from both focus groups in order to identify emerging themes. Shields and Twycross (2008) state that content analysis is a useful technique for making inferences by systematically and objectively identifying specified characteristics or messages. Full versions of the transcripts were carefully studied and any pauses or paraphrases were removed to prepare a clean dataset. Next, content was carefully analysed to identify the occurrences of the same words, phrases, sentences, or paragraphs that embodied ideas about the topic. These idea clusters are known as emerging themes (Woods, Priest, & Roberts, 2002). The coding process identifies any encapsulated ideas that need to be brought to attention. This analysis process was further enhanced by the constant comparative method borrowed from Grounded Theory research (Strauss & Corbin, 1990). This strategy involves taking one piece of data and comparing it with all others that may be similar or different in order to develop conceptualisations of the possible relations between various pieces of data (Strauss, 1987).

Findings from the data analysis are illustrated in the next section. These findings are clustered according to the logical sequence of the focus groups as well as question groupings.

4.2. Findings

4.2.1. Focus Group 1

4.2.1.1. Reading on paper

The participants from Focus Group 1 indicated that they read books, magazines, newspapers, articles, scientific papers, and travel type documents on paper. A wide variety of reasons were provided when they were asked why they read on paper. After reading and re-reading their responses the following themes were derived as to why participants would choose to read paper material. Figure 1 below indicates the coding schema.

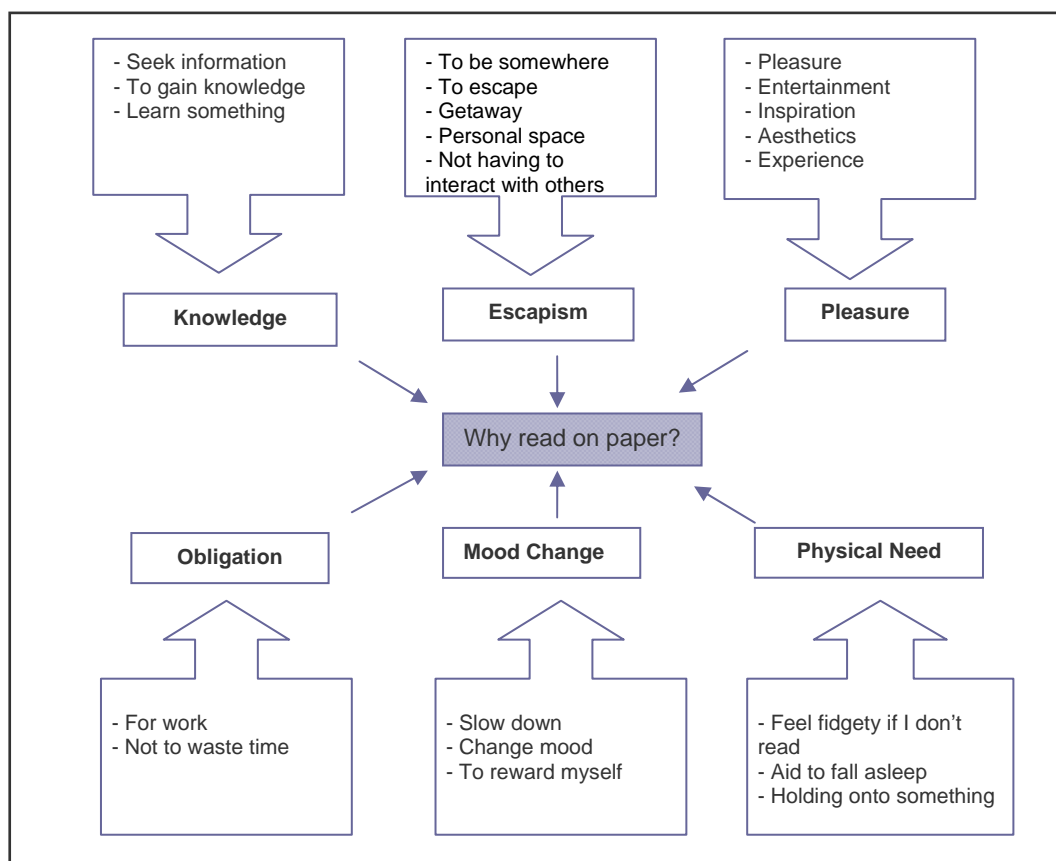


Figure 1 - Why read on paper? (Focus Group 1)

‘Knowledge’ was identified as an important reason why respondents chose to read. Although the questions were mainly aimed at reading on paper most of the responses were based on reading in general. Many participants agreed that one major motive for reading is to seek information and learn new things. One participant summed that as gaining knowledge.

The theme ‘Escapism’ was derived from clustering reasons such as getaway or escape from everything, to mentally be somewhere, have some personal space, and avoid having to interact with others. Two participants acknowledged that they read while travelling to and from work. Participant A₁ commented that she read on the train because she could escape to a whole new world and avoid all the crowding that occurs in trains. The participant further commented that “I could be on the train. But I could be in some rural village in Ireland”. All other participants were inspired by how deeply she could engage with the reading. In general, there was a vast amount of synergy within the team and the body language of the participants indicated that they all agreed with each others’ responses.

‘Pleasure’ was identified as another reason for reading on paper. Participants discussed how they enjoyed going into a book shop and browse books although they might not buy them. Participant D₁ found that reading was an inspiration which took the reader out of their norm. A few participants also indicated that they chose to read on paper due to the ‘reading experience’ they gained in terms of aesthetics. Two participants commented:

“It’s the aesthetics that make me choose paper materials. For example, I won’t read my fashion magazine online”
(Participant E₁)

“Frankly, the only time I use paper now, is when paper adds to the experience. By that I mean, often travel type documentation where the well presented material complements the text. You have got instant access to the correct images. National Geographic magazine kind of a thing, then it becomes more of an experience. Well laid out. That’s something you don’t often get on screen.”
(Participant D₁)

Reading out of ‘obligation’ was another theme that emerged from the focus group discussion on why participants choose to read on paper. Almost every participant agreed on this since Focus group 1 contained mainly professional participants who read on paper and screen as a work related activity. One participant commented that she would not read when she went home due to sore eyes after reading on screen and paper during work time. Some participants expressed that they chose to read something so that they did not waste time. Participant F₁ commented that she felt she was wasting time if she had to stare into empty space while she travelled to and from work on the bus.

Reading was also chosen as a mechanism to ‘change the mood’. A few participants commented that they would read to wind down after a long day. One participant stated that she would read after completing all household chores. This indicates that reading was seen as a reward by some people.

A close bond between reading and people’s daily lives were emerged as to why people may read. One participant commented:

“I always have to read one or two hours every night otherwise I feel a bit fidgety.”
(Participant E₁)

A few other participants also indicated that they would read before going to bed for at least an hour. Holding onto something physical was also indicated as to why they would choose to read paper material as opposed to reading something on a computer screen. Therefore, these comments illustrate that reading had become so habitual that it was entwined with participants’ daily routines. The theme ‘physical need’ was derived by grouping these responses.

Home, work, and library were discussed as the major places to read while some participants indicated that they would read while commuting to work. In terms of the time of the day, almost every participant indicated that they read during the business hours due to work commitments and before or after work for personal interests.

When participants were asked to explain the way they read paper material in general, most of them indicated that they would prefer to read word by word if they read a book. A few participants indicated that they tended to skim read their business documents in order to save time. Almost every participant agreed that they scanned newspaper headlines and read only the content that interested them. Some participants indicated the difficulties they faced while reading a book or a journal where they became lost in the context. Participant A₁ disclosed that she kept a little notebook where she noted down the important information that might be needed later in the reading process.

4.2.1.2. Reading online

In terms of what participants read online, web pages such as Wikipedia, travel websites, online news, and business documents were clearly the most commonly read online materials. Almost every participant agreed that they used search engines to look for information on the Internet and tended to read the pages that the search engine took them to. It must be noted that none of the participants preferred to read online books. One participant pointed that after a full day staring at a screen it is preferable to read something on paper as opposed to online.

A wide variety of reasons were given as to why participants read online materials. The following themes were revealed once the open coding was applied to responses given by the Focus Group participants. Figure 2 below illustrates the coding schema.

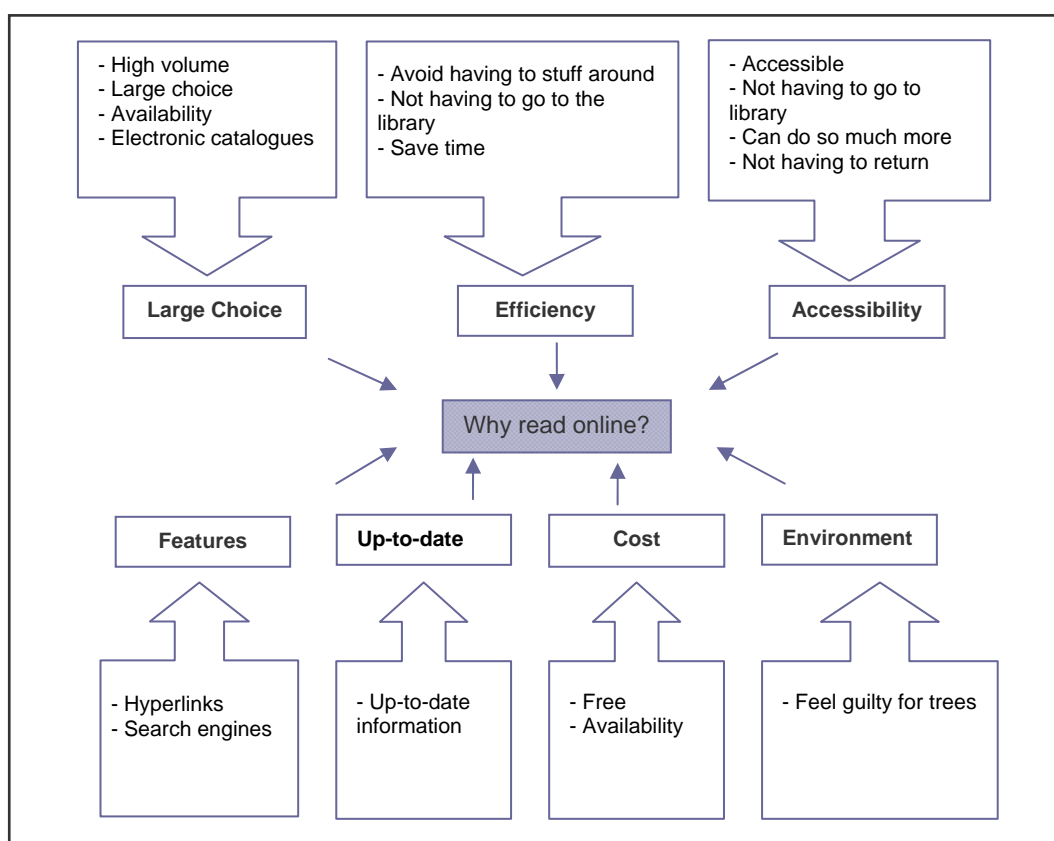


Figure 2 - Why read online? (Focus Group 1)

One of the major drivers for choosing to read online was the availability of a large choice of materials. High volume of information on the Internet provides unlimited amount of reading materials. Participants discussed Wikipedia as an example for a large information repository

they accessed. The availability of online catalogues was recognised as a significant benefit since the participants did not have to visit libraries or bookshops. Participants also expressed the view that they had more control over their reading online due to the availability of large amount of information that came from a variety of sources.

Efficiency was noted as a key reason for choosing to read online. One participant stated that the availability of large amounts of content gave him much wider perspective. The filtering mechanisms enabled him to narrow down the information and reach required information much faster. Participants also found online reading more efficient due to not having to visit a library or a bookshop to obtain materials. Participant C₁ commented:

"I hate that library experience. I never liked it. All that time wasted. I hate not being able to find what I wanted. But I used to use them only out of.." (Participant C₁)

Accessibility was also chosen as a reason to read online. Participants found that having information from all over the world at your finger tips was a useful feature of online materials. Ability to search within text was identified as one of the finest features of all online materials. Participants D₁ commented that he used it every so often to quickly locate the information that he needed. Hyperlinks which guide the reader to more relevant content, making online reading a positive experience, was also mentioned in the Focus Group. A few participants expressed their view that one of the fundamental reasons for them to choose online material was the probability of online material being more up to date, compared to paper materials. One participant commented:

"It's up to date. It's a big thing for me" (Participant B₁)

Cost was also emerged as a key reason for the participants to choose online materials. Many participants expressed that materials being free was an important factor that contributed towards her choice to read online, especially the newspapers.

The inevitable, environmental consideration was also brought up by one participant. Other participants agreed and noted that they felt better reading online rather than printing the articles or reading a printed version when they thought about the environmental impact of using paper materials. One participant commented:

“god I feel guilty, look at all those trees..”

(Participant D₁)

Finally, one of the participants referred to the change of media over the past few years and how people have to respond to the new way of dissemination of information. Examples were taken from New Zealand TV news where the news readers instructed viewers to go to the TV website to see full details of the news item.

When the discussion was extended to explore where and when participants choose to read, the responses which were received were similar to the responses they gave about paper materials. The participants indicated that they read on screen during the day due to work commitments. All participants of the Focus Group 1 worked in an office environment where they were constrained by the technology in at work.

The way participants read online was significantly different to the way respondents read paper materials. One of the fundamental elements was the use of the search/find function in order to narrow down the information they sought. Participants indicated that they skimmed through content much faster and read only the content that they were interested in. One participant commented:

“My eyes are darting around all over the place. And I sometimes think that’s not very good because you are training yourself to do that”

(Participant E₁)

Although the search feature benefits the users to find the content faster, it also limits the user to a much narrower scope and potentially misses some crucial information unless the users have advanced online/Internet skills and capabilities. Two participants indicated that they printed the material if it was longer than two pages. A mix of reading patterns were presented in terms of the use of hyperlinks where some participants indicated they clicked on every link to read more information while others indicated they tended to skip them in order to focus on the current material. A few participants stated that they did not actively engage in reading when online and tended listen to music or watch the television in order to make the most of time.

Trust was another factor that emerged through the discussion where participants preferred to read content from a known organisation or of a known author. Flavian & Gurrea (2007)

stated that trust is one of the key factors that affect the reading of digital media online. Having to filter unnecessary content, advertisements, or pop-up windows were also sought as a part of the online reading experience. These commercial contents were identified as externalities that hindered the online reading experience.

4.2.1.3. Comparison of online and paper materials

Last section of the Focus Group was aimed at obtaining participants' view on online vs. paper materials and to uncover any impacts that online material might have on their reading behaviour. The first question was based on their thoughts on reading experience on paper vs. online materials. Table 3 below consolidates the responses provided.

Table 3 – Reading on paper vs. reading online (Focus Group 1)

Reading on paper	Reading online
Positives Better concentration Better comprehension Ability to make notes Ability to flick pages Ability to highlight	Positives More efficient Filtering capacity Search Capacity More resources Bookmark web pages Digital material can be zoomed Hyperlinks Better information delivery
Negatives Books heavy to carry around	Negatives Harder on eyes More inclined to skim Screen is interruptible Technical issues Requires a device to access Getting lost Some screens are too small to read

The participants discussed both positive and negative aspects of reading online vs. reading on paper. Better concentration and comprehension were provided as the two major positive outcomes of reading on paper. The participants also expressed the importance of the reading experience where they could hold on to a book, flick pages, and make notes on them. A few participants noted that one of the drawbacks of paper materials were the weight which made them heavy to carry around.

The group also found many positive outcomes of online materials. Efficiency and the large amount of information were the obvious benefits of online materials. Participants also found that online materials contained better usability features such as search and zoom-in functions

which were not present in traditional paper media. Hyperlinks were quoted repeatedly as one of the best features of online materials.

In contrast, participants also identified many negative characteristics that hindered the online reading experience. Stress on the eyes was a major concern for many participants. Since the majority of the participants were middle aged, they found that smaller text, and glare on screen caused their eyes to tire easily when they read online. The majority acknowledged that they were more inclined to skim read on screen as opposed to paper. Some participants admitted that they got lost reading online especially on web pages where they used hyperlinks to navigate to pages. The need of a device to access the information, and technical issues were the other negative features which were identified by the group.

When the participants were invited to discuss differences on the way they read on each medium many participants unveiled that they tended to skim read online material. Few participants stated that they always looked for a piece of information within the text hence tended to skim. Participant A₁ commented:

“I would look at the introduction and I want to go to the conclusion. I find in an electronic one it’s not actually seem full to me like on paper.” (Participant A₁)

During further discussion Participant F₁ made a compelling argument that we may tend to skim read online due to way that the content is written. She commented:

“I would suppose that the web content is in most cases differ significantly from the print content because of the medium if it is a good website, the web page is written for the web which means it’s written for skimmers.” .” (Participant F₁)

Many participants printed material to read and found that reading on paper facilitated better concentration and comprehension. Interestingly, Participant C₁ confessed that she had given up reading books on paper and preferred online materials. The participant shared her experience with the group that how she was an avid reader as a child, and how she had completely lost interest in reading books and preferred to read more online.

All participants agreed that they read more due to availability of online materials.

4.2.2. Focus Group 2

This section reports the findings from Focus Group 2 and it will follow a similar structure to the previous section. While reporting this section it has endeavoured to reduce repetitive findings and place more emphasis to indicate new findings.

4.2.2.1. Reading on paper

Focus Group 2 participants indicated that they read books, magazines, newspapers, poems, and work and study related materials on paper. When they were asked to provide particulars on why they read on paper, a variety of reason were given. Figure 3 below illustrates a consolidated view of the codes which uncovered by analysing the given responses. Four major themes emerged during this process.

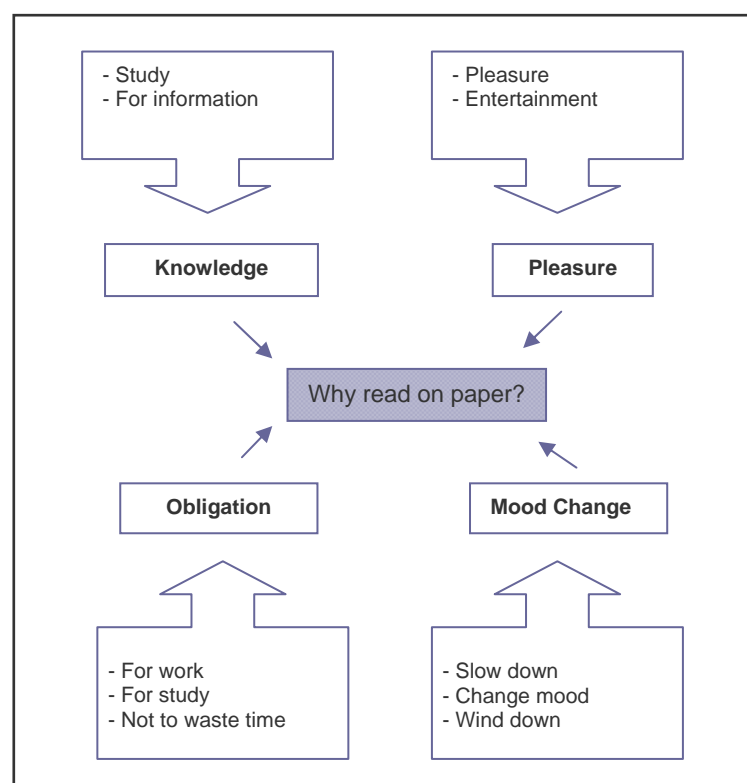


Figure 3 - Why read on paper? (Focus Group 2)

Similar to the first focus group, knowledge was identified as a key reason for participants to read on paper. Since the group contained few tertiary education students they revealed that they carried out a substantial amount of reading on paper (i.e books and articles) due to their

study. Pleasure was another reason which was discussed as why they would tend to read. One participant commented:

"I read poems, I read books, I read for pleasure"

(Participant C₂)

Focus Group 2 participants also revealed that they read due to work and study commitments. The young workers within the group indicated that most of their daily reading included work related materials. One participant also noted that she would probably read something to not to waste time. Participant B₂ mentioned that she read every night in order to slow down. Other participants also agreed that they preferred to read something before going to sleep. These responses indicate a closer relationship to the responses received in Focus Group 1. However, one participant indicated that he preferred to browse the Internet as opposed to reading something on paper.

When participants were asked to provide information on where they did most of the reading, many participants stated that they mostly read paper based materials at home, before or after work. One participant shared his long lasted habit of reading the newspaper as one of the first things he did in the morning. He also noted that there was a significant change on that behaviour after migrating to New Zealand and now using online newspapers. The student participants indicated that they went to the library when preparing assignments and studying for exams. Reading while commuting to work (i.e on the bus or train), was also indicated as a preferred place to read by many participants.

Different participants revealed different patterns of reading paper materials. Some preferred to read cover to cover where others preferred to skip the introduction and go straight into the topic they preferred to read. Few participants indicated that they scanned the content first and went back and read the sections that interested them. Participant E₂ commented:

"There is this one magazine I read every month. And I read every single word in it. Every single article regardless I am interested or not because I can broaden my perspective"

(Participant E₂)

Participant D₂ conceded that the sequence of reading a newspaper or a magazine depended on the individual's interest. For example, he read sport section prior to reading any other section

of a newspaper or a magazine. Similarly, Participant C₂ stated that he preferred to read humorous content first and read the remainder later.

4.2.2.2. Reading online

Focus Group 2 participants commented on a diverse selection of online content that they chose to read. Online newspapers, web pages, blogs, and journal articles were the key material participants read online. Similar to Focus Group 1, participants indicated that they did not prefer to read books online.

A range of reasons which were more or less similar to Focus Group 1 were presented by the participants for reasons for reading online materials. Six themes were revealed as a result of the content analysis applied to the response data.

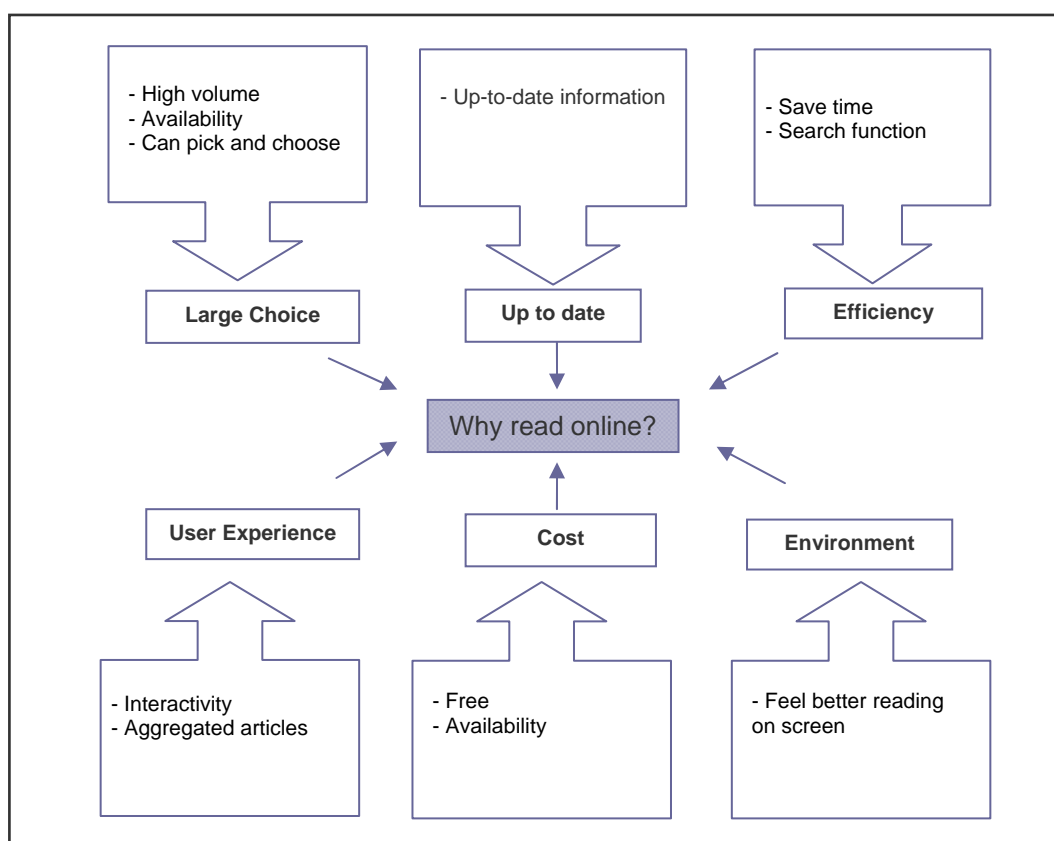


Figure 4 - Why read online? (Focus Group 2)

The availability of large amounts of textual information was identified as a prominent reason for choosing online materials. Due to the availability of a high volume of data, participants found that online material gave them the flexibility to pick and chose. Up to date information was a key reason for participants to choose online materials over printed media. This was

mainly in newspaper and education areas where participants emphasised the importance of having the most up to date information. Participant B₂ commented:

“I don’t want the stuff that was done the day before which get printed out overnight. I want to know the stuff that happened last.”
(Participant B₂)

Access to a large amount of information without having to physically visit a library or a bookshop, and the ability to use filtering mechanisms to obtain necessary information were identified as other reasons why participants preferred online materials. These are identified as the efficiencies that online materials created over its counterpart.

Some online materials such as websites deliver a rich user experience by aggregating relevant information together. Many of them offer interactive features which engage the reader to create an interactive environment. Focus group participants stated these features enabled online material to be more appealing to use.

Availability of free information on the Internet was a common reason for using online materials by both focus group participants. One participant commented that it was the main reason for him to select online material over paper materials. Focus Group 2 members also stated that they felt better reading on screen, when they thought about the amount of paper they used which created an environmental impact.

As the narratives from participants unfolded, the younger group started discussing how they adored technologies like Apple™ iPods and Apple™ iPhones. Few of the participants shared their experiences of using iPhones as a convenient reading tool:

“If I want to check the bus time, the iPod is just in your palm and you just quickly check what the time it is. It’s a waste of time if you are waiting for the computer to turn on”
(Participant G₂)

Due to the availability of such technologies some of the Focus Group members indicated that they read while commuting to work and university. Work and home were still the most common places where participants seemed to perform the majority of their reading. Student

participants indicated they used the university library facilities. Everybody agreed that they read throughout the day.

Focus Group 2 participants indicated similar behaviour to the Focus Group 1 participants in terms of the way they read online. The majority offered comments on how they skimmed, scanned, and read headlines. Additionally, few participants found that the use of multiple tabs in web browsers helped them to focus on the material they read without having to navigate to another page. Focus Group 1 participants criticised that they tended to get lost by using hyperlinks however the participants in the second Focus Group seemed to have identified a solution to that issue. Features such as Really Simple Syndication (RSS) were also commonly used among the Focus Group 2 participants. One participant commented:

“I constantly read stuff that is in my Google reader. Different categories and different topics and I have that constantly open. Both at home and work.” (Participant E₂)

It was evident that the familiarity with technology and tools had enabled the Focus Group 2 participants to achieve a significantly different level of online reading experience compared to the Focus Group 1 participants.

4.2.2.3. Comparison of online and paper materials

Focus Group 2 participants also provided a good comparison between online and paper materials. Similar to the Focus Group 1, better concentration and comprehension were the top two positive features of paper materials. Paper was chosen as a better medium to read for relaxation. Participants considered they could easily lose interest with paper materials. The interactive nature and rich media content of online materials could potentially maintain readers' interest. Student participants found that the time it took to locate relevant information on a book was much higher.

On the other hand, participants found online media was far more efficient in terms of retrieving information. High volume of content, being more up to date, and the use of search engines were identified as other key features of online materials. The group felt online materials were far more flexible to use compared to paper materials. One participant argued that online material enables people to broaden their perspectives. The reliability of information that is available on the Internet was identified as a negative factor of online materials. The limited size of screens, hence the need for scrolling, were noted as negative usability features of online content.

Many participants agreed that the chances for getting distracted are higher during online reading. Participant D₂ commented:

"If I'm reading a particular topic unless I am really focused, thousand times I would check my emails, news, and other stuff"
(Participant D₂)

Tertiary student participants commented that they preferred to print out what they had to read in order to avoid distraction. The participants considered that they would do a better job at reading if they printed them out. Especially preparing for exams, they preferred to study using paper materials. Childhood experience of reading paper-based study materials, as opposed to electronic materials were discussed as a likely reason that might influenced this behaviour.

Responses from the participants are summarised in the Table 4 below.

Table 4 – Reading on paper vs. reading online (Focus Group 4)

Reading on paper	Reading online
Positives Better concentration Better comprehension Relaxation Ability to highlight Feel of holding a book/magazine	Positives Easier to satisfy Search capacity Quick More efficient More information Volume Broaden perspective Most up to date information Flexible
Negatives Takes long time to find things Get bored easily	Negatives Not always accurate Cannot highlight Cannot hold on to like a book Limited screen size (e.g. Laptops) Having to scroll Harder on eyes Distraction

The group agreed that they tended to skim read online content. They also noted that there were more tendencies to skip online content. Everyone agreed that they read much more due to the availability of online materials. A few participants believed that their reading behaviour had shifted over the time due to technology and online medium itself. Participant E₂ commented:

“My reading has shifted a little bit especially with the iPhone. It’s the first thing I touch in the morning. And when I go to bed I also read twitter. I used to finish with a book before.”
 (Participant E₂)

4.3. Summary

Overall, Focus Group1 and 2 provided valuable insight to reading on paper and online. While the majority of the responses were comparable, each group contributed their own views on online and paper materials. Focus Group 1 participants demonstrated their years of experience using paper materials and how they still very much prefer them while Focus Group 2 participants had many narratives to share about the new technologies and how they adopted those in their reading activities. Due to the way groups were formed, demographic, social, cultural, and environmental factors influenced on the dynamics of group behaviour. The group members often brought out spontaneous reactions and ideas. The first focus group participants had many common experiences they wanted to share being in similar age and social background. There were many enthusiastic respondents who wanted to contribute their experiences all the time. Focus Group 2 participants had common topics such as latest technology and mobile devices that they wanted to focus the discussion around all the time.

The group discussions revealed many significant factors which were not discussed in the current literature. One example was how people read out of obligation. Both groups commented on their need to read large amount of business related content on screen due to work commitments. Another example was that couple of participants indicating that they need to read as a daily activity otherwise they feel uneasy. The features such as aggregating content and environmental factors that influenced online reading were also not commonly discussed in the current academic literature. Therefore, the focus groups enabled exploring a variety of aspects of online and offline reading through group interactions while drawing the research focus to areas that were not foreseen. Both groups were very co-operative and willing to provide their feedback despite audio and video recording were in place.

It was essential to validate these finding on a larger sample in order to form generalisations to be made regarding the phenomena being investigated. Therefore, the Phase 2 of the study included an online survey which was sent out to a large global sample. The next section presents the data collection and findings of Phase 2 of this research study. This phase was conducted approximately two months after the focus groups.

5. Phase 2

5.1. Data Collection

Phase 2 of the data collection comprised an online survey which was sent out to a wider sample via email. Survey research is a systematic attempt to collect information, mostly from individuals, to describe and explain the beliefs, attitudes, values, and behaviour of selected group of people (Gray, Williamson, Karp, & Dalphin, 2007). The findings from the survey can then be generalised to the wider population. Survey research can include quantitative and qualitative elements, but is usually quantitative with a limited qualitative element, which is more likely to be anecdotal than truly qualitative. Questionnaires are used as a data collection technique for the surveys (Pickard, 2007).

Using an online questionnaire provides various benefits over conventional paper based questionnaires. Firstly, the researcher has a greater flexibility in displaying the questions using graphics, help instructions, menus, and controls that allow users to select only required number of answer options (Sharp, Rogers, & Preece, 2002). This leads to improved quality of survey data and easy administration. An online questionnaire allows responses to be received more quickly from subjects (Bradburn, Sudman, & Wansink, 2004). The method is also cheaper to administer as there are no costs associated with purchasing paper or other materials for printing. Postage costs are also mitigated (University of Maryland, 2009). Since the data is collected into a central database, the time for analysis is subsequently reduced (StatPac, 2009). Finally, it is easier to correct any errors in an online questionnaire since the researcher does not have to reprint the questionnaire for re-distribution (Sharp, Rogers, & Preece, 2002).

Despite all these benefits, there are few potential drawbacks of using online questionnaires. The response rate may drop due to not everyone having access to the Internet. In some instances, online questionnaires allow an individual to submit multiple responses and it is particularly difficult to restrict submission from individuals outside the designated sample (Pickard, 2007). However, due to the nature and the duration of this study, an online questionnaire was the best choice since we needed to capture a large number of responses from participants who read online (i.e. who used the Internet).

A convenience quota sample was chosen for the survey. The sample consisted of participants who were over 18 years of age and used the Internet and online materials. They were selected from the researcher's work colleagues, friends, friends of friends, and Victoria University School of Information Management students. The sample contained respondents from Australia, China, Denmark, Germany, India, New Zealand, South Africa, Sri Lanka, United Kingdom, and United States. The sample contained participants with various levels of education, industry training, and exposure to the Internet and online materials. The survey invitation was distributed via emails and the social networking site, 'Facebook'. The Facebook invitations were distributed via 'personal messaging' only to the researcher's contacts in order to ensure that the survey respondents were over 18. The survey invitation comprised an electronic copy of the information sheet and a link to the online questionnaire. Invitations were sent to 250 people in the expectation of receiving 100 completed responses. After assessing the response rate a week from the date the first invitations had been sent out, the questionnaire was sent to the Library and Information Services in New Zealand (NZ-Libs) mailing list in order to increase the number of responses.

The information sheet contained a brief description of the research, its objectives, the potential benefits, and the strategies to protect participants' privacy and confidentiality. (See appendix 9.2.1) The online survey was completely anonymous and did not collect any personal details that could have identified the individuals. As an incentive for their input, the participants were also given the opportunity to enter into a lucky draw to win one of three \$50 book vouchers. Participants were provided with the opportunity to request an abridged version of the final research report. As with the lucky draw for prizes, in order to preserve the anonymity of the participants, on completion of the survey they were provided with a link to another website where they might request the report.

The questionnaire was based on the focus groups' questions and findings. A popular online survey instrument, Qualtrics, was used to produce the survey and collect the data.

Participants were asked to respond to questions based on their overall reading experience. The questions were categorised into four major areas: reading in general, reading on paper, reading online, and a comparison between offline and online reading. Questions from the first section were used for identifying why people read and how they felt while engaged in

reading. The second section was focused on reading paper materials whereas the third section was aimed at online reading. Both sections contained similar questions to the focus groups', however new questions were also included based on the findings from the focus groups. The fourth section attempted to obtain a contrast between respondents' opinions on paper vs. online reading. Rating scale questions were included in this section in order to capture respondents' impressions on concentration, comprehension, content absorption, content recall, and relaxation levels while reading online and paper materials. The last few questions were aimed at capturing the impact of the online environment on people's reading behaviour and were open ended allowing the respondents to add details they wished to provide. The benefit of open ended questions is that they generally do not have any predefined parameters to restrict the respondents (Pickard, 2007). A demographic section was added to the end of the questionnaire to obtain respondents' age, gender, the amount of time they spent on reading, and levels of experience with the Internet. While designing the survey, all the questions received careful scrutiny to ensure they were sufficiently formed to capture essential information, thus used suitable question types, and provide hints to respondents where appropriate. (See appendix 9.2.2 for the full list of questions.)

The survey was active for 14 days. Out of 500 survey invitations, 281 were completed and submitted. Among those 281 that was received, 79 were unusable due to incomplete data, hence only 202 were included in the analysis. The likely reason for the 79 incomplete cases would be the 14 day limit that was set when the questionnaire was made live. No imputation was carried out to fix the unusable cases due to the smaller size of the research project.

The findings from Phase 2 of data collection (online survey) are presented below.

5.2. Findings

This section is structured as follows. Firstly, the survey demographics will be presented. Then, the findings on reading in general, reading on paper, and reading online will be discussed. This will be followed by the comparison section which will provide findings on comprehension, concentration, content absorption, content recall, and relaxation levels of the respondents while reading paper and online materials. The subsequent section will present the findings on how people perceive both media. Finally, the impact of the online environment on people's reading behaviour will be presented.

Figures, graphs, and tables will be used where appropriate. Graphical display of data is one of the most important aids in identifying and understanding patterns of data and relationships among the variables (Caputi & Balnaves, 2001). Graphs and plots draw out hidden relationships among variables that a person may not have anticipated. Caputi & Balnaves (2001) identifies a good graphical representation as good communication.

5.2.1. Demographics

A representative mix of respondents who belonged to different age groups undertook the survey. One of the key objectives of this survey was to obtain a broad perspective of the selected topic from a wide age group. As indicated in Figure 5 below, a good representation of the age groups was found in the group of respondents who undertook the survey.

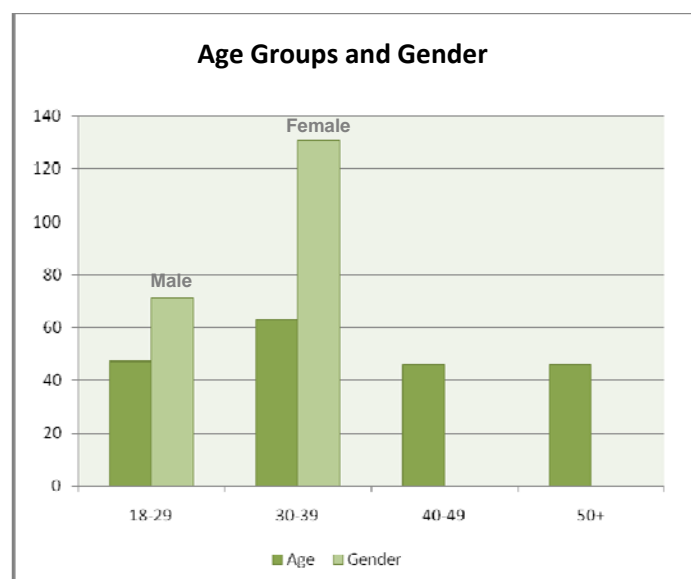


Figure 5 – Age groups and gender of the respondents

The majority of respondents belonged to '30-39' group (31%) while other age groups consisted equal numbers (23%) of participants. Out of all respondents, the majority were females and they represented 65% of the total number. All respondents indicated that they read both online and paper materials. (See appendix 9.3.1 for detailed demographic data.)

English was selected as the primary language by 167 respondents whereas 34 respondents selected “other” as their primary language. This might be due to the fact the survey was sent to participants all over the world via email contacts and Facebook.

The questions that asked respondents about their reading hours on each medium revealed mixed results. Figure 6 below illustrates the average number of hours respondents read each medium.

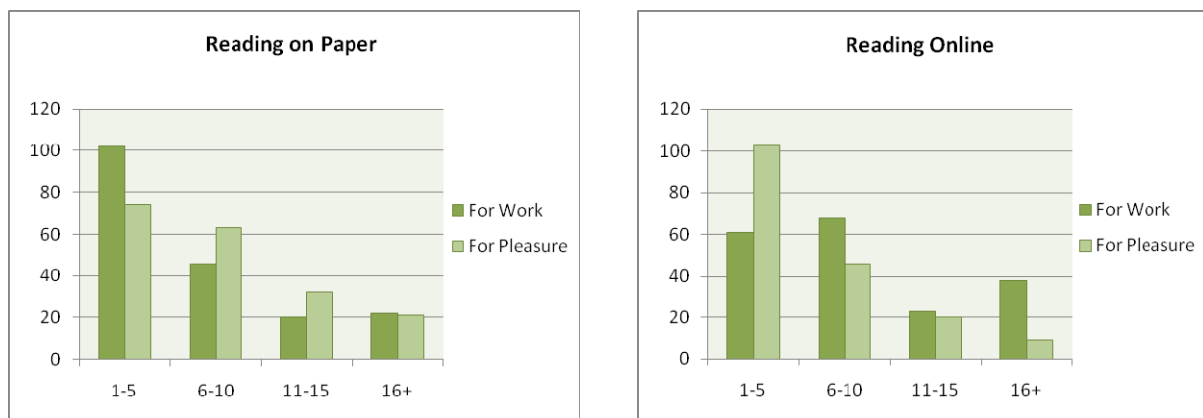


Figure 6 – Number of hours reading on paper and online.

On average, the majority of the respondents spent less than ten hours per week reading on paper. Respondents indicated that they spent longer hours reading for pleasure on paper than for work. The findings indicated that the majority of the respondents also spent less than ten hours per week reading online. Among these, more read for work than for pleasure. A significant fact is that the people who read online materials for over 16 hours per week were primarily engaged in reading for work as opposed to pleasure. When the media were compared, the findings indicated that people read more for pleasure on paper (190) than on screen (178). It is also important to note that longer reading hours were noticeable online as opposed to paper.

Over 54% of the respondents had 11-20 years of online experience while 28% indicated 3-10 years of experience and 16% more than 20 years of online experience. Only 1% of the participants had less than 3 years of online experience. Since the respondents had adequate online experience, it enabled obtaining well informed responses and good comparisons between the media.

5.2.2. Reading in General

The first question of this section was designed to capture responses regarding why people read. The question allowed respondents to select multiple answers, and which medium they preferred for each reason. The respondents identified seeking information, commitments, and pleasure as the top three reasons for them to read in general. The other more common choices were inspiration, accessibility, lifestyle choice, relaxation, escapism, and availability. Interestingly, these findings demonstrated similarities to the findings from the focus groups conducted in Phase 1 of this research study. Table 6 below illustrates an abridged version of the responses received for this question. (The full list can be found in appendix 9.3.2)

Table 6 - Why do people read

#	Question	Paper	Online	Responses
1	To seek information	158	222	380
2	Must read for work, study etc.	167	204	371
3	For pleasure	209	117	326
4	For inspiration	143	135	278
5	Because it's accessible	70	160	230
6	As a lifestyle choice	132	86	218
7	To relax	150	60	210
8	To escape	152	55	207
9	Because it's available	79	127	206
10	Because it's free	66	132	198
11	To have personal space	122	53	175
12	To reward myself	111	46	157
13	To change my mood	75	50	125
14	To save time	13	107	120
15	Because of the large choice	44	65	109

A total of 380 responses were received for 'seeking information' as the top most reason for reading. Of this 380 responses, the majority selected 'online' as their choice of medium while slightly less number of respondents chose paper. There were many instances that respondents indicated that they preferred both media. Work and study commitments were recognised as the second highest motive for reading and a total of 371 responses were received for this category. It is important to note that more respondents selected online materials than paper materials. A total of 326 respondents selected reading for pleasure as the third highest reason

for reading. Two thirds of these respondents indicated that they preferred paper material for pleasure reading.

Inspiration, accessibility, and lifestyle choice were the next most popular reasons for reading. Online medium was clearly the choice of medium for accessibility.

The next most commonly selected option was related to relaxation. It is fascinating to see that over two third of the respondents selected paper as their choice of medium. Similarly, 75% of the respondents who selected escapism as a reason for reading had chosen paper as their choice of medium.

Availability and low cost were also identified as reasons for them to read. Online materials deliver the benefit of having 24/7 access as opposed to paper materials. In general, many respondents identified reading as a method of having personal space. Out of 175 respondents 122 selected paper as the medium of their choice. Furthermore, respondents chose to read as a means of rewarding themselves. Some recognized reading as a way to change their mood. In both cases paper was more frequently chosen as the preferred medium. The availability of search and filtering mechanisms, therefore online materials being more efficient, was also discussed in the focus group findings.

Respondents frequently selected all options provided for the questions. A few participants also included other reasons for why they read. Reading as a hobby, and as a tool for problem solving were some of those reasons provided by the respondents.

Overall, the responses received for this question reinforced and strengthened the findings from the focus groups.

When respondents were asked about how they felt about reading, the majority stated that they immediately thought of books and relaxation. Inspiration, peace, satisfaction, immersion, and fantasy were also frequently used to explain their thoughts about reading. Some respondents indicated that refreshing their knowledge, learning, betterment, and enrichment were thoughts that came to their minds. A few respondents noted that reading was a part of life and it was “natural as breathing” while some had mixed views. The respondents commented:

“On one hand reading is a really great thing to do, something for pleasure or to just relax. On the other hand there is the ‘having to read something’ as for example for my studies. As soon as it becomes a ‘have to do’ the pleasure and the fun (all the good things I like about reading) is suddenly gone”

“When reading for pleasure, thoughts are largely centered around escapism, personal and mental space, relaxing, winding down, and passing time. When reading for work or study, thought are mainly around speed and effort required to assimilate knowledge, comprehension of the material, and knowledge retention.”

Overall, relaxation was the most frequently stated motivation. However, as indicated above, some responses depended on the reading material they chose. Some respondents indicated that people considered reading as an important part of their professional and personal development.

5.2.3. Reading on paper

This section of the questionnaire aimed to capture people's reading behaviour on paper materials. The questions were formed to acquire information on what, when, where, and how they read paper materials. All these questions provided a predetermined list of answers to select from and an option to include any new answers. Figure 7 below illustrates the average number of hours per week respondents spent reading various types of paper materials.

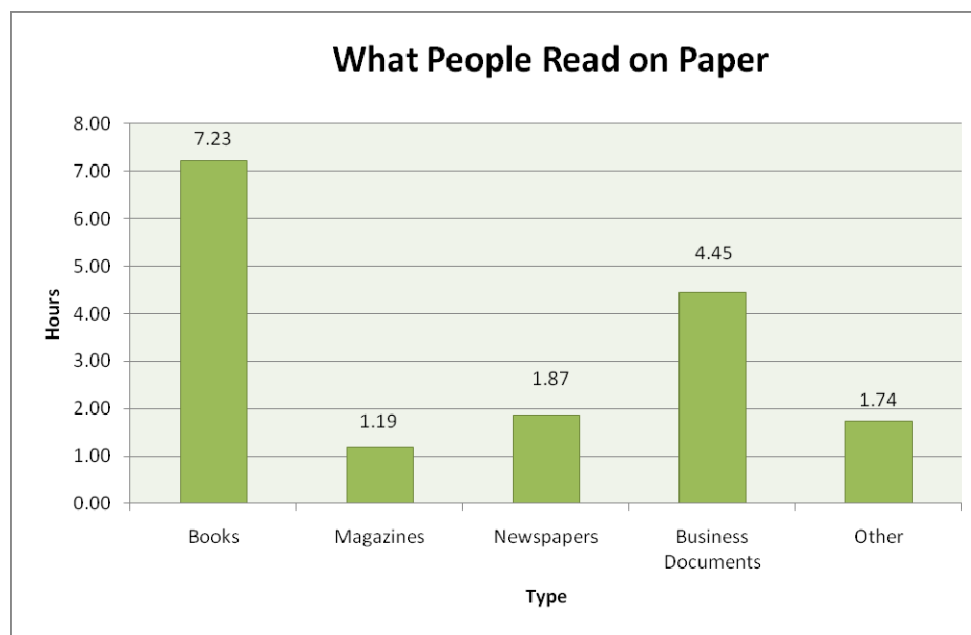


Figure 7 - What do people read on paper

Books were the most read paper material. Out of all survey respondents, 188 selected books and on average they spent 7.23 hours per week reading them. Business documents were the second mostly read paper material and on average 4.45 hours were spent on reading them. A total of 143 respondents stated that they read paper based business documents. The respondents stated that they spent nearly two hours per week reading newspapers. A number of respondents selected the 'other' option and offered a range of materials which were not included in the answer list. One of the dominant 'other' types was study related materials. Academic literature, prescribed reading, journal articles, and research papers were commonly listed by the respondents. Newsletters, leaflets, and advertising materials were also listed as other non study related materials. On average, 1.74 hours were spent reading 'other' materials. Magazines were the reading material, on which least time was invested. On average the respondents spent only 1.19 hours reading magazines.

Figure 8 below exemplifies where people typically read paper materials.

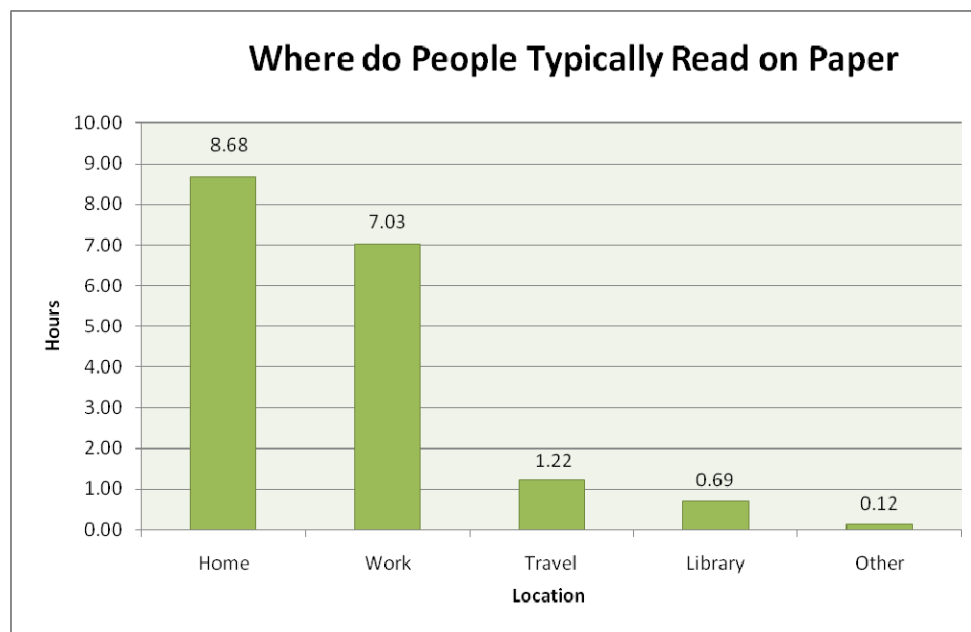
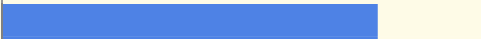







Figure 8 – Where do people read on paper

A total of 193 participants stated that their residence was the primary location for reading paper materials. On average, the respondents spent 8.68 hours reading at home. Work was the second most common place to read and 162 respondents acknowledged that they spent about 7 hours per week reading at work. The number of respondents who chose this option closely correlated with the number of responses received for 'business documents' in the previous question. Over 70 respondents read while travelling and the number of hours they spent ranged from 0.5 to 20 hours per week. The low number of responses indicated that the library is not a common place for people to read. Only 34 respondents, which was about 17% of the total respondents, selected the library as a place they chose to read. This result might relate to the Internet's uptake and libraries offering more online materials which could be accessed without physically visiting them. A few respondents also indicated that they read in locations other than the ones listed in the answer list. Cafes, waiting rooms, and leisure reading at parks were included in those responses.



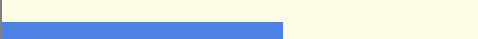


Respondents' reading time seemed spread out throughout the whole day. Table 7 below displays the responses provided by the survey participants. The majority of respondents read in the morning. However there was no significant difference between morning, afternoon, evening, or before going to bed. A lower number of respondents read during their mealtimes. A few respondents selected the 'other' option and provided more specific responses, such as in the middle of the night when they could not sleep, in the bath, and all day on weekends.

Table 7 - When do people read

#	Answer		Response	%
1	Morning		164	78%
2	Afternoon		150	72%
3	Mealtimes		84	40%
4	Evening		159	76%
5	Before going to bed		158	76%
6	Other (Please specify)		14	7%

In an endeavour to capture the way people read, the survey probed respondents' reading behaviour. Although reading patterns can be determined by the material they choose to read, the question clearly indicated that it aimed to obtain a general view. The question also allowed for multiple answers due to the fact that participants might have more than one reading pattern. Table 8 below illustrates the summary of responses.

Table 8 – How do people read

#	Answer		Response	%
1	I start from the beginning and read to the end		172	82%
2	I skim read		86	41%
3	I scan the content and read only the content that interests me		124	59%
4	I read the first part and skip to the last part.		23	11%
5	Other (Please specify)		22	11%

Out of 202 responses, 172 (82%) indicated that they read from the beginning to the end. Scanning content and reading only the content that interested them was chosen as the second most common reading pattern. A total of 86 participants, that is 41% of the total, indicated

that they skim read paper materials. A lower number of respondents indicated that they read the first part and skipped to the last part of the content. Of the total number of respondents, 11% selected the 'other' option and stated that their reading behaviour depended on the content that they read. One respondent commented:

"The reading behaviour depends very much on what I'm reading business documents I may skim or read right through, magazines and papers I skim, recreational books - beginning to end"

The next section presents the findings on participants' reading behaviour on the online environment.

5.2.4. Reading online

The third section of the questionnaire aimed to uncover people's reading behaviour online. The questions were formed to acquire information on what, when, where, and how they read online as well as what devices they used. All these questions offered a list of answers and the ability to add any other answers respondents might have.

Since people required a device to access online materials, the aim of the first question was to capture that information. Out of all respondents, 80% reported that they used a computer for reading online content. Laptops were the second most commonly used device and 64% of the respondents used them. It is important to note that mobile devices such as mobile phones, PDAs, and iPods were also used by the survey participants. The majority of respondents who selected the 'other' option included iPods and PDAs in their answers. E-readers were the least common device and only four respondents reported using them. Table 9 below illustrates the summary of responses.

Table 9 – What devices people use for reading online

#	Answer		Response	%
1	Computer		161	80%
2	Laptop		130	64%
3	Mobile Phone		25	12%
4	E-reader		4	2%
5	Other (Please Specify)		17	8%

The respondents provided a good representation of types of material that they read online. A predetermined list of answers was provided but other answers were also welcomed by allowing respondents to enter new text. Figure 9 below indicates the average number of hours participants spent per week reading different types of online material.

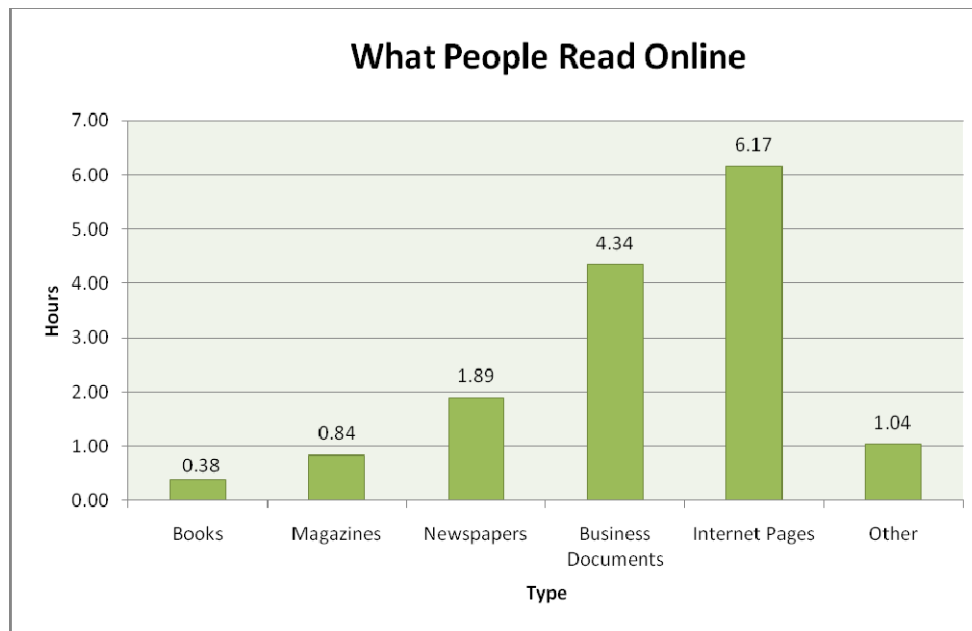


Figure 9 – What do people read online

A staggering 90% of participants stated web pages as the most commonly read online material. On average, the respondents spent 6.17 hours per week reading web pages such as wikis, blogs, and online forums. Business documents were the second most commonly read online material and the number of hours people spent was similar to the number of hours they read paper based business documents. The third most popular reading material was online newspapers. On average 1.89 hours was spent reading online news. Fewer respondents chose online newspapers as opposed to ordinary newspapers; however, the number of hours they spent reading online were greater, thus the average number of hours remained very close. A few respondents also indicated that they read online materials other than the ones listed in the answer list. These included academic content such as journals, publications, and technical papers as well as general web content such as emails, RSS feeds, and newsletters. The respondents confirmed the findings from the focus groups that people did not prefer to read books online. Only 27 out of 202 survey participants indicated that they read online books.

The respondents indicated that they spent the largest number of hours reading online content at work. The average number of hours per week was 8.5. A greater number of respondents (172) selected home as the most common place for reading online as opposed to work (164). However, the number of hours they spent reading at home was less than the number of hours they spent reading at work. On average, the respondents spent 5.37 hours per week reading online materials at home. A significantly smaller number of hours were spent at the library

reading online materials. The results indicated that, on average, 0.54 hours were spent in the library by 20 participants.

As discovered in Focus Group 2, people often read online content while commuting. A total of 21 survey respondents reported that they read online content while travelling. The average number of hours spent reading online content while travelling (0.29) is significantly smaller than the number of hours respondents spent reading paper based materials (1.22).

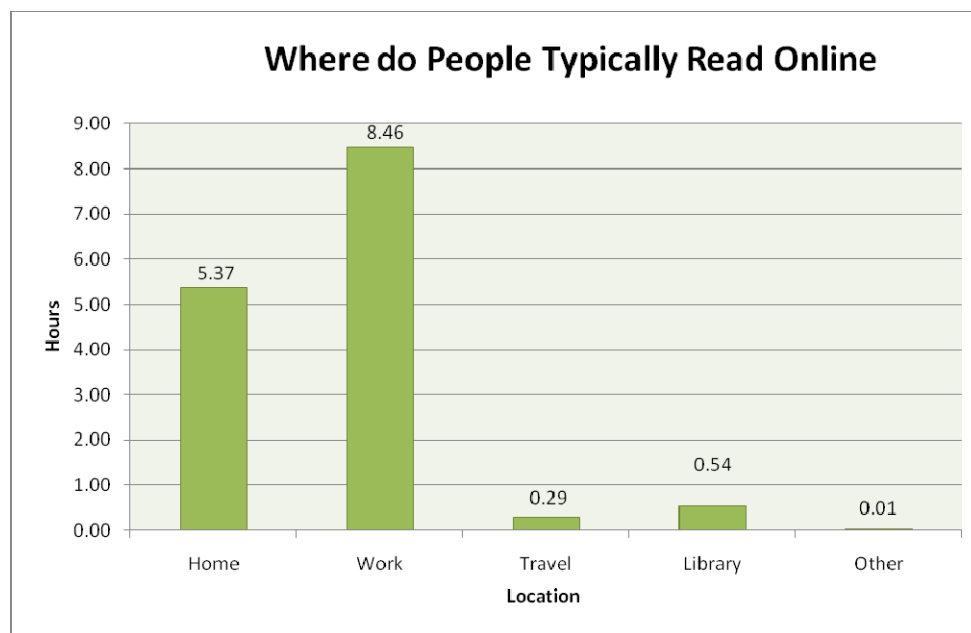
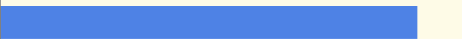


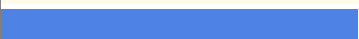
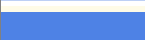



Figure 10 – Where do people read online

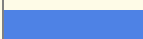
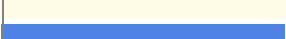
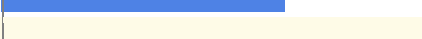


Reading times for online materials were scattered throughout the day. The majority preferred to read online materials in the morning and the afternoon. A total of 176 respondents reported that they read in the morning and 163 reported that they read in the afternoon. Respondents also indicated that they preferred to read online in the evenings. Reading online at mealtimes was significantly lower than reading paper materials. However, the most significant difference was in the number of respondents who read ‘before going to bed’. A total of 158 respondents indicated that they preferred to read paper material before going to bed while only 62 respondents indicated that they preferred to read something online before they slept. The difference might be due to similar findings from the focus groups which were related to the medium itself (i.e. screen), the physical discomforts that occur while sitting in front of a computer or a laptop, or simply the preference of taking a book to the bed. Table 10 below indicates a summary of responses.

Table 10 – When do people read online

#	Answer		Response	%
1	Morning		176	87%
2	Afternoon		163	81%
3	Mealtimes		45	22%
4	Evening		150	74%
5	Before going to bed		62	31%
6	Other (Please specify)		4	2%

The way participants read online was different to the way they read on paper. The most frequently selected reading pattern was scanning the content and reading only the content that interested them. A total of 176 participants, (87% of the respondents) chose this option. Skim reading was the second favoured method of reading online content, with 59% of the respondents selecting this option. Reading from beginning to end was chosen as the third preferred option by only 31%. By comparing the findings on how people read paper materials vs. online materials, it is noticeable that reading from beginning to the end was significantly less in the online environment. Skim reading and scanning content seemed to occur more with online materials as opposed to paper materials. A few participants included other methods of reading and many of them used the Find option on web browsers and other computer applications to do keyword searching to find the precise content. Table 11 below illustrates the summary of the responses.

Table 11 – How do people read online

#	Answer		Response	%
1	I start from the beginning and read to the end		63	31%
2	I skim read		119	59%
3	I scan the content and read only the content that interests me		176	87%
4	I read the first part and skip to the last part.		19	9%
5	Other (Please specify)		10	5%

Most respondents (72%) revealed that they printed out the materials to read. The focus groups conducted in Phase 1 of this study reached the same conclusions. McKnight (1997), Finkelstein (2004), and Juon (2009) also found that the majority of the people did not like to read on screen and rather printed materials out.

5.2.5. Comparison of online and paper materials

After setting the scene, and collecting all the background information, this section aimed to obtain data on how people adopted online reading and the impact of the online environment on human reading behaviour. Therefore, this section of the questionnaire was considered crucial to answering this study's objectives

The first question asked about changes to the amount of content each person read. Out of all the survey participants, 133 (66%) admitted that the amount they read had increased due to the availability of online materials. The next group of questions probed participants' comprehension, concentration, content absorption, content recall, and relaxation levels while reading paper verses online materials. (See appendix 9.3.5 for detailed responses and statistics.)

5.2.5.1. Comprehension

Out of the total number of respondents, 60 reported that their comprehension levels when reading on paper were very high. Another 111 respondents reported high comprehension levels and 22 reported neither high nor low. Only 9 respondents reported low comprehension levels and no one recorded that they had very low comprehension levels. Figure 11 below illustrates the comparison of comprehension reported against online reading.

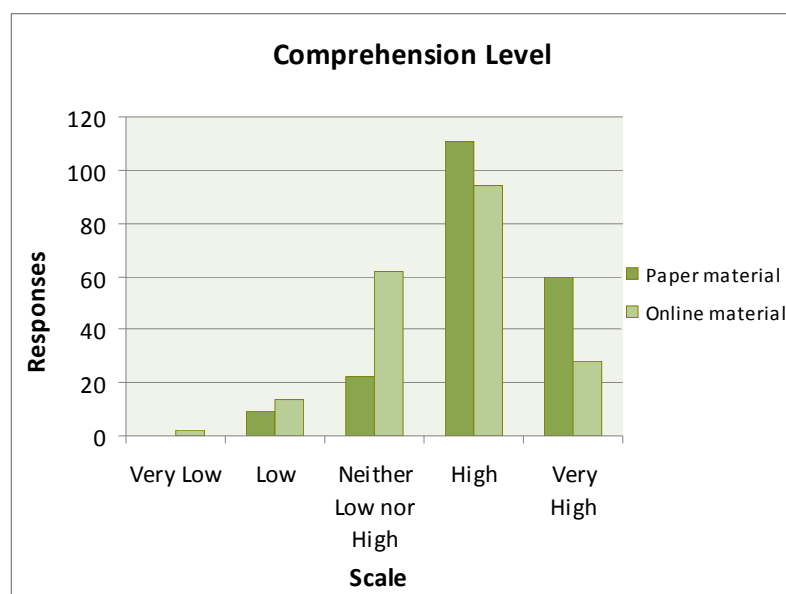


Figure 11 – Comprehension levels while reading

When considering online materials, only 28 respondents recorded that they had very high comprehension levels when reading online. While 94 survey participants indicated that they had high comprehension levels, 62 respondents reported having neither high nor low comprehension levels. A total of 14 respondents recorded that they had low comprehension levels and two recorded very low comprehension levels while reading online.

It can be seen that there was a noticeable shift towards low comprehension levels while reading online materials. A significantly smaller number of respondents reported high concentration levels compared to reading on paper.

5.2.5.2. Concentration

Of the 202 survey respondents, 168 recorded that they had high or very high concentration levels while reading on paper. No responses were recorded for having very low concentration levels while only eight survey participants indicated that they had low concentration levels. Neutral responses were recorded by 26 survey respondents.

In contrast, 37 survey respondents admitted that they had low or very low concentration levels while reading online. Only 12 respondents reported that they had high concentration levels while 79 and 72 individuals reported having high and medium (neither low nor high) concentration levels respectively.

When comparing these findings, which are depicted in Figure 12 below, the perceptible change is the dropping number of responses for high concentration levels and the increasing number of responses for lower concentration levels.

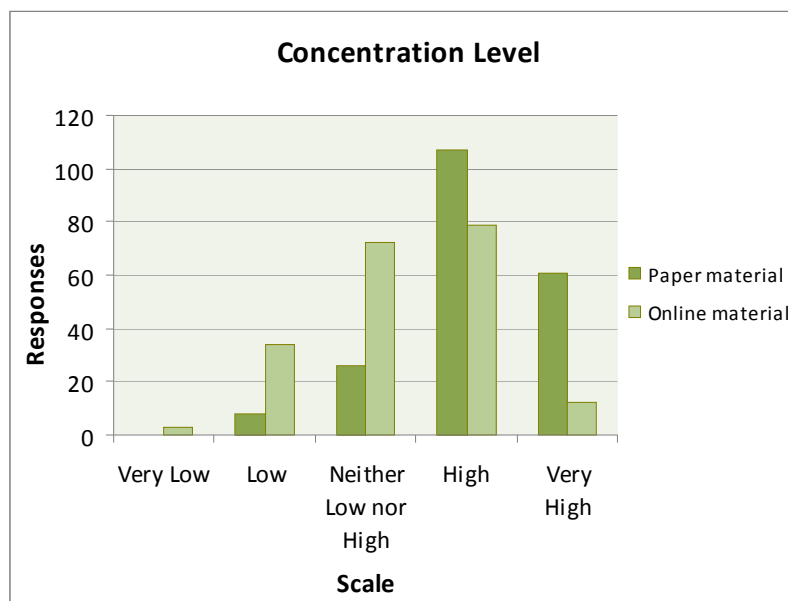


Figure 12 – Concentration levels while reading

5.2.5.3. Content Absorption

Out of all 202 respondents, 115 reported that they had high content absorption levels while reading on paper. The ‘very high’ option was selected by 49 participants. Only four survey participants reported that they had low content absorption levels while all others reported that they had neither low nor high content absorption levels.

In comparison, 28 respondents had low or very low content absorption levels for online materials. Only 10 respondents acknowledged having high content absorption levels. A total of 81 participants had high content recall levels for online materials. Many participants had medium content absorption levels.

Overall, it is evident that the respondents noticed higher content absorption levels on paper compared to online materials. About 15% of the total number of respondents found online content having some effect on their content absorption levels.

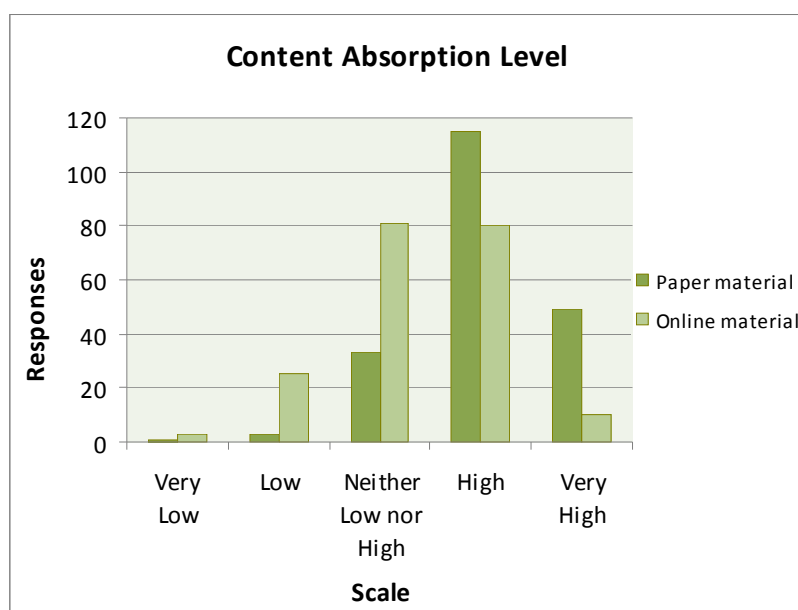


Figure 13 – Content absorption levels while reading

5.2.5.4. Content Recall

Survey respondents predominantly indicated that they had high content recall of paper materials. A total of 115 respondents recorded that they had either high or very high content recall of paper materials. Only 20 survey participants disclosed having lower content recall and no participants indicated having very low levels. About one third of the total number of respondents reported having neither low nor high content recall levels.

The content recall levels while reading online materials demonstrated a similar trend to the comprehension and concentration levels with regards to paper materials. A lower number of respondents reported high concentration levels while a higher number of respondents recorded lower content recall levels. Of all responses, 86 reported that they had neither low nor high content recall levels when reading online. A total of 47 reported having low or very low content recall levels while 67 reported having high or very high levels.

In general, respondents seemed to have better content recall capabilities if they read on paper than online. The summary of the results are shown in figure 14 below.

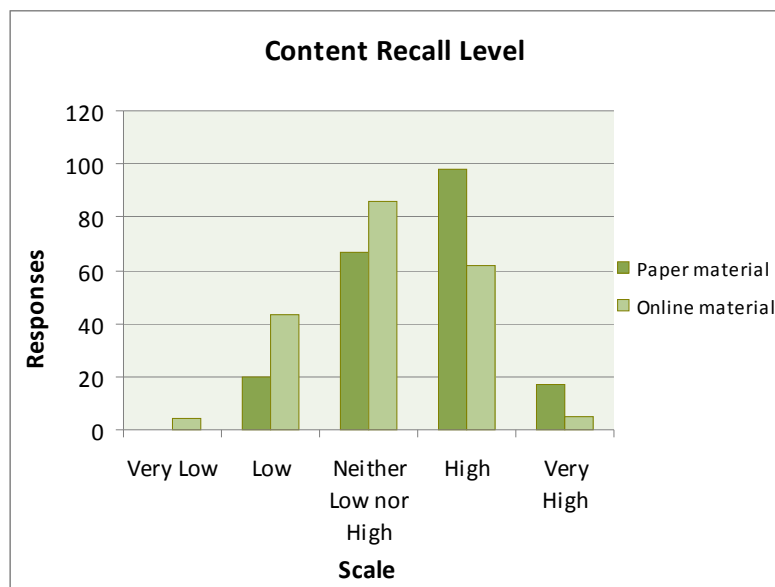


Figure 14 – Content recall levels while reading

5.2.5.5. Relaxation

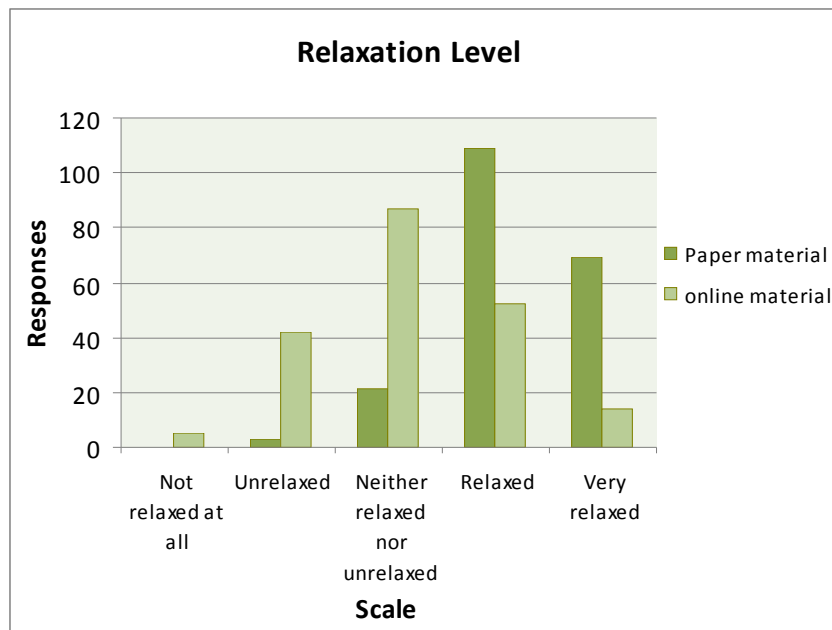


Figure 15 - Relaxation levels while reading

As shown in Figure 15 above, the majority of respondents seemed either very relaxed or relaxed while reading online materials. Out of the 202 respondents, 179 supported this argument by selecting values from the top end of the scale. Only three respondents stated that they were not relaxed while reading paper.

In contrast, there was a significant increase in the number of respondents who admitted that they did not feel relaxed while reading online materials. A total of 47 participants supported this and another 87 survey participants stated that they felt neither relaxed nor unrelaxed while reading online.

Figure 16 below presents a consolidated view of the above findings. Both histograms illustrate a ‘normal distribution’ pattern. In general, reading on paper is distributed towards the positive end of the scale where reading online includes both the low and high ends of the scale, demonstrating the ordinary ‘normal distribution’ pattern. The number of responses recorded against the high end of the scale was significantly lower for online materials. A greater amount was recorded against the middle and lower end of the scale. The mean value for paper materials (3.99) being greater than the mean for online materials (3.31), indicated respondents felt much higher levels of comprehension, concentration, content absorption, content recall, and relaxation while reading paper materials as opposed to reading online.

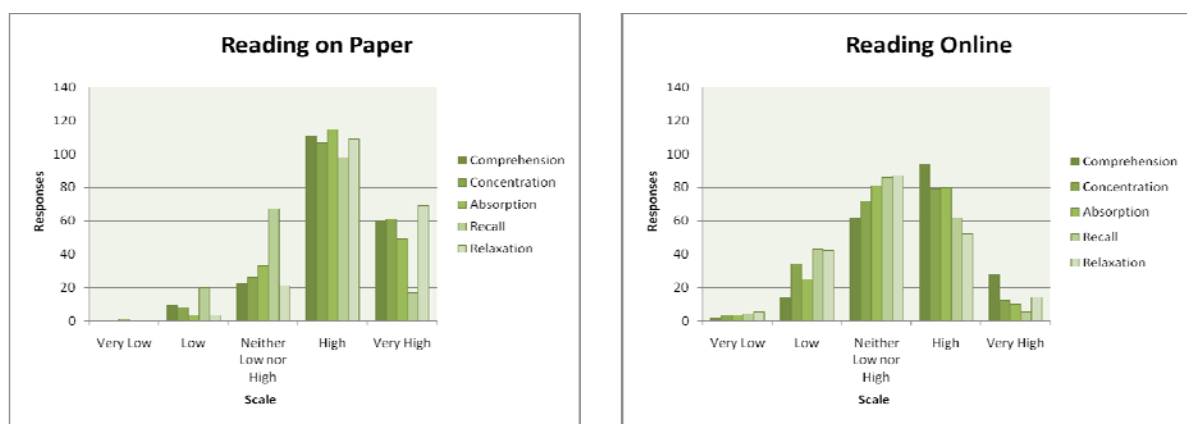


Figure 16 – Reading on paper vs. Reading online

The respondents indicated mixed opinions with regard to online graphics, hyperlinks, and advertising materials. While 29% of all survey participants concluded that they definitely got distracted by those externalities on web pages and other online content, 21% stated that they did not. All the other participants reported that they sometimes got distracted by graphics, links, and advertisements.

Cross analysis was conducted on the findings in order to understand the relationships between the variables. “Exploring relationships between variables means searching for evidence that the variation in one variable coincides with variation in another variable. (Bryman, 2008, p.325)”. There are many techniques available for examining relationships but their use depends on the nature of the variables being analysed. The analysis focused on demographic variables such as gender and age, to reveal any relationships they might have with respondents’ online experiences. Line graphs were produced as a visual aid to comprehend the correlations between the variables.

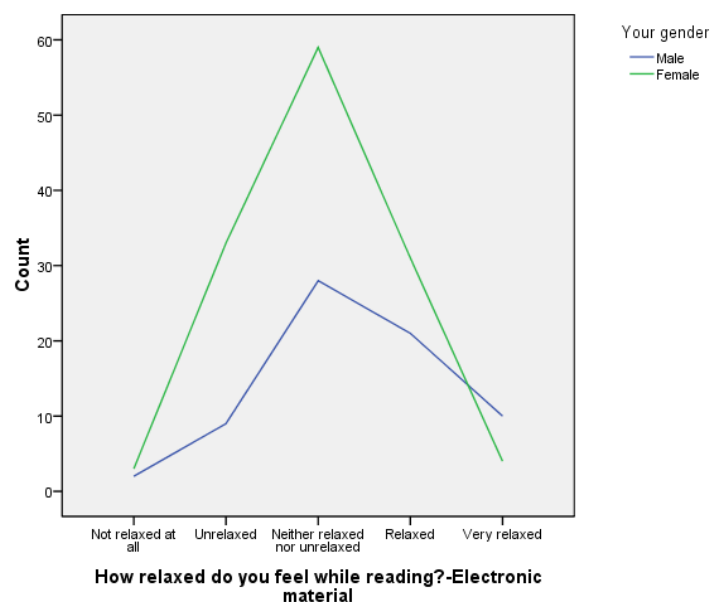


Figure 17 – Gender vs. Relaxation levels in the online environment

As Figure 17 illustrate above, when gender was compared with relaxation levels in the online environment it can be seen that males demonstrated greater relaxation levels compared to females. Similarly, males seemed to prefer reading online materials more than women. There was a significant drop in the number of female respondents for the online materials while a larger number preferring paper materials. Figure 18 below demonstrates this correlation between the gender and the preferred medium. When the preference was compared with the age groups it was evident that age group 18-29 was more inclined towards online materials compared to all other age groups. As the age increased the preference for online material decreased. Figure 19 below demonstrates this relationship. (See appendix 9.4 for more correlation diagrams between the variables.)

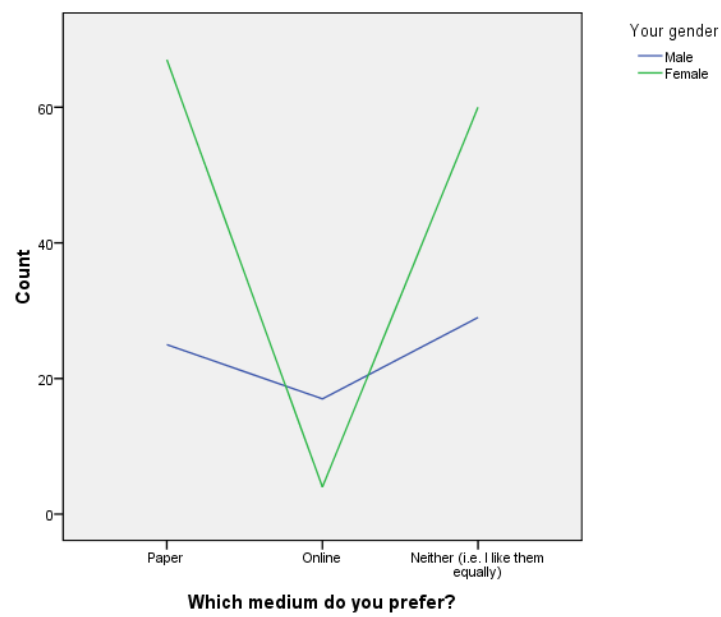


Figure 18 – Gender vs. Preference of the medium

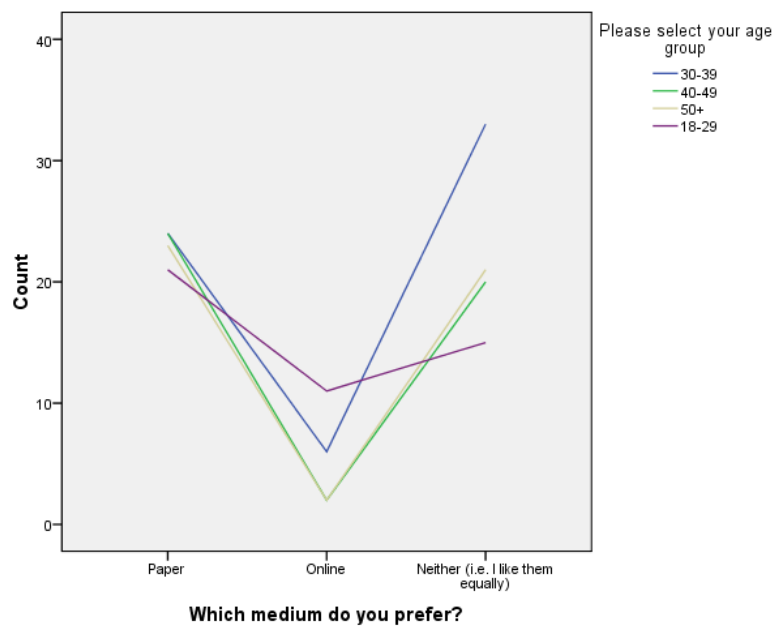


Figure 19 – Age vs. Preference of the medium

A large 88% of participants indicated that they had noticed a difference between the way they read online and the way they read on paper. Of the survey participants, 65% admitted that they had observed changes to the way they read over the past few years. These numbers reflect Carr's (2008) argument that people's reading behaviour and the way they think is changing.

The next section examines the responses to all open ended discussion questions which asked about how respondents felt reading online and offline materials, and the differences noticed between each medium.

5.2.5.6. The way people read on paper vs. online

Table 12 below summarises the differences people noticed in reading online vs. paper materials.

Table 12 – The way people read on paper vs. online

Online	Paper
Skim read Scan Impatient Browsing rather than been involved Speed reading Quick Selective reading Cross reference Less linear Jump Moving about all over the place Flicking between pages Back and forth Fragmented Read in small chunks Multitask Never read long items Use search/find	Detailed reading Read everything Slower reading Sequentially Linear fashion Highlight and annotate Scan through the document Read more widely

The most commonly cited reading behaviour for online content was skim reading. Many participants indicated that they read online primarily for work and to seek information. Therefore, they wanted to get through a lot of content and get to the point within the shortest time possible. Scanning the content was also repeatedly recorded as an online reading behaviour. Some participants indicated that they felt impatient while reading online. One survey participant commented:

“I skip more and I am more impatient while reading online”

Another participant indicated that online reading tended to be browsing rather than getting involved with the content.

The speed of reading in the online environment was also perceived. The majority of respondents commented that they read much faster online and improved speed reading over time. One respondent stated that this was due to the large amount of information that was available and could be accessed in electronic format. A few respondents indicated that they are more 'selective' when reading online.

The respondents also observed that they tended to cross reference when reading online materials. The availability of hyperlinks on some online content had encouraged this behaviour. The integrity of online content had been a reason for people to cross reference information in the online environment. The cross referencing, thus jumping between pages seemed to have affected the linear reading pattern therefore many respondents reported that online reading was more fragmented. Several respondents acknowledged that they read in small chunks and did not read long articles online but printed them if the article caught their interest. Using the Search/Find feature in computer applications was also reported as a commonly followed behaviour while reading online. Many survey participants admitted that they tended to multitask when reading online (i.e read emails, check news, listen to music) and got distracted as a consequence.

In terms of reading on paper, the respondents reported that they performed slow and detailed reading. They were also inclined to read everything from word to word in a linear fashion. A few respondents highlighted and annotated content when reading on paper. All these reading behaviours seemed to contribute to better information retention levels, a phrase that repeatedly appeared in the survey data. One respondent commented:

"I find it easier to retain information and take in what I'm reading if it is on paper"

5.2.5.7. Changes to reading behaviour

One of the research objectives was to identify these changes to assess the impact of the online environment on people's typical reading behaviour. Some survey participants had witnessed changes to their reading behaviour over time. The most common comment was that respondents read more due to the exponential growth of online materials. Of the respondents, 66% stated that the amount of their reading had increased due to the availability of online materials. The respondents also disclosed that the speed of their reading had improved. Some respondents acknowledged that they skim read a lot more and their ability to skim read had improved. Two respondents commented:

"I read more quickly to get to the point of an article."

"The speed at which I read online is very fast, and I only read in chunks now with a view to getting straight to the core bit of information that I need."

Some respondents revealed changes to their patience as a reader. Due to large amount of digital materials, especially on the Internet, people searched through numerous web pages everyday looking for a piece of information. As a result, they tended to skim read and scanned most material in order to get through it fast. Some respondents acknowledged that they read much faster to get through large amounts of content, especially the work related materials. This indirect pressure might have contributed to the change of patience in modern readers. Some survey participants admitted:

"I have less patience as a reader in all mediums. I skim a lot more than I used to, taking away key points and less fully formed ideas"

"With print I try to take my time with it, but increasingly I find I struggle to read something slowly and wish I could get to the point as quickly as I do with electronic material."

"I have less patience when reading anything that is not recreational on paper, I feel it's a chore and something I must do."

Short attention span was emerged frequently in respondents' comments. Many admitted that they had low levels of concentration and shifted focus therefore missed out on a lot of words

during reading. This could lead to missing crucial information in important documents such as work related documents. A few respondents described this as ‘less engrossed’ and ‘less careful’ reading behaviours. Two survey participants commented:

“I have noticed that I have a shorter attention span, so even when I read in print, I am more likely to choose things that are quick to read, or more magazine-style in format.”

“Because there is so much material about now, and online material needs to be short in order to keep your attention, sometimes I find it hard to read to the end of a hard copy of a long prose article.”

As a result of low concentration levels, some respondents stated that they did not seem to absorb content as they used to. A few respondents argued that this change was due to the vast amount of information that they dealt with every day. Two respondents commented:

“I don't absorb as much because it seems there is so much information out there.”

“I skim read news/articles online. Very surfacey. Don't seem retain/recall information well. Need to read articles several times sometimes”

The lack of concentration and the fragmented nature of online reading have also had negative impact on some readers. Reading a book generally requires discipline to focus on the material. The continuous skimming and fragmented nature of online reading affect the discipline of reading. Wolf (2007) raised concerns over plight of ‘reading brain’ as it encounters this technology rich society. According to the author, the capability of the human brain to rearrange its neural circuitry to learn something new raises concerns over unforeseen consequences on reading, thinking, and cognition in the digital age. One respondent commented:

“It's harder to 'get into' a book now. My reading is much more fragmented and ephemeral. I read more small things”

The respondents indicated signs of people’s adaptation to the new medium. Some survey participants revealed that they were becoming more accustomed to the online medium and preferred it over traditional paper materials. Some commented:

“I’m more comfortable reading from a screen. Would like to try an e-reader, even for recreational reading, as I am far more comfortable than I used to be with the electronic written word”

“More demanding - I want relevant material from multiple sources and I want it now. Reluctant to read paper reports, but will scan if electronic.”

Finally, many participants indicated that they did not enjoy reading on screen as opposed to reading on paper. Out of all survey respondents, 46% selected paper as their preferred reading medium while only 10% selected the online medium. The remaining 44% stated that they did not prefer one medium over the other. One survey participant concluded that he/she had started appreciating reading on paper as opposed to reading on screen.

“I’ve actually started to read more print-based books because I’ve rediscovered how much I enjoy it compared to online surfing.”

Overall, the survey data provided a comprehensive overview of people’s reading behaviour in online and offline environments. The survey clearly delivered the large amount of data to justify its selection as a research tool for this study. It reached a geographically dispersed community at a very low cost. Although the majority of participants were based in New Zealand, a good representation of other nationalities was also present. The demographic data established that all age groups were adequately represented. Due to the carefully crafted questions a good combination of numerical and textual data were collected.

As a result of these characteristics, the online survey allowed the researcher to explore the research topic more deeply. The rich collection of data was also useful for verifying the findings from the focus groups. The next section of the report discusses and discloses the critical findings from both the focus groups and the online survey.

6. Discussion

The study provided an interesting insight into how people read online and on paper. While some of these findings verified and strengthened the current literature on reading, perceptions, and adoption of the online environment, themes that demonstrate several new directions and dimensions also emerged. The discussion section reviews results from both phases of this study, and presents a consolidated view of the major findings. These findings will be discussed under separate headings. The section will also discuss the theoretical implications of the research findings.

Evidently, the time spent on reading has increased due to online materials. Research participants revealed reading behaviours which were unique to paper and online materials. The levels of people's comprehension, concentration, content absorption, and content recall were also affected. The relaxation levels while reading online and on paper were heavily influenced by the medium. Despite the development and distribution of a variety of technological devices with screens, the majority of people printed the materials out to read.

6.1. Increasing time spent on reading

People are spending more time on reading in the information age. Although the amount of time spent on reading is highly dependent on work, study, and family responsibilities, both focus groups and survey participants equally reported that they spend more time on reading mainly due to the availability of online materials. Of all survey participants, 66% reported that they read more. The finding is quite consistent with other statistics from similar studies (Liu, 2005; Tenopir, 2009). A few factors can contribute to the increase in reading time:

1. information upsurge
2. digital technology
3. work/study commitments

Nowadays, the majority of workplace documents are created and stored in digital form. Universities and schools offer more online content. Publishers release more online books and journals. Therefore, the amount of digital information is steadily increasing. This information

upsurge directly or indirectly forces people to read more. The online documents also allow more opportunities in accessing further information due to the hyperlinks. For example, an online document may have a number of hyperlinks. King (1998) reported that the average number of links in an online document was 22 with a range from 1 to 81. Weinreich, Obendorf, and Mayer (2008) reported online documents having 53 links on average and found that the number of links positively correlates to the number of words in the page. This means that when a user accesses an online document, he/she has the chance to access multiple other documents at the same time.

The mobile technology seems to make information more accessible; as indicated by participants in both research phases, people have started using iPhones and iPods to access information on the go. A very recent development called Apple™ iPad, a more sophisticated device than the traditional e-reader, seems to have opened up a debate about whether it can take people to a whole new level of reading. The new device has the combined characteristics of an e-reader, as well as a personal computer/laptop, and a mobile phone.

This study revealed that work and study commitments were the second highest reason for the increase in reading. Business documents were the second most common material people read on both online and paper formats. The reading times indicated that most of the people read throughout the day especially during the business hours. Student participants also noted the obligatory reading due to study commitments.

Another fact that needs to be noted is that people are confronted with the sheer volume and variety of information. How much, and how long they choose to spend on reading is a very important decision, given the fact that they cannot increase the time on reading infinitely. The next section reviews the offline reading behaviours which were revealed in this study.

6.2. Paper based reading

Prior to the industrial revolution, people were reading quite intensively. The amount of material they had access to was quite limited therefore they read them over and over again. Since then, people have started to read things quite extensively. They read all kinds of materials: books, periodicals, newspapers, and read things only once before racing on to the next item (Darnton, 1989). Today, there are immense amount of books, magazines, and periodicals which gives readers the opportunity to choose what they want to read and how they want to read. Therefore, today's reader has a wide range of choices in terms of reading materials.

The participants of this research study indicated that the concept of reading immediately brought books and relaxation to their minds. Books were still the number one paper material people read. The findings indicated that people read more paper based materials at home as opposed to work where most of the material they read was based online. Therefore, an obvious link emerges between reading books at home and relaxation. As per the comments from numerous survey participants they read books to relax in the evening especially before going to bed. Some admitted that they read a book as an aid for sleeping. The focus group participants indicated that they read books to wind down, change their mood, and escape to a much more pleasant atmosphere avoiding all the turmoil they had to deal with everyday.

People like to annotate when they read, especially for in-depth reading. Annotating and highlighting while reading is a common activity in the printed environment. Annotating electronic documents is certainly achievable but it requires much more resources and an additional skill set than a simple pencil or highlighter. O'Hara and Sellen (1997) found that annotation on paper is smoothly integrated with reading. Several research participants confirmed that they frequently highlighted study materials, and the physical layout of a paper material along with highlighting helped them to remember the content.

The participants from both phases of the study identified the discomforts related to reading on screen. The focus group participants stated that paper is kinder on their eyes as opposed to reading on a computer or a laptop screen. This was confirmed by the dropping number of

survey respondents selecting online materials to read in the evening and before going to bed. (See Table 7 and Table 10).

The increasing amount of online materials, as well as the technology becoming more prevalent, poses the questions on the future of paper as a medium. The current literature presents mixed conclusions while some argue paper media may fall behind due to the advancements in the technology. According to Curtis (2009), reading books is falling out of favour - 84% said they read for pleasure in 2006, 80% in 2007 and 74% in 2008. However, the findings from this study reveals that paper is still very much preferred as a medium for relaxation and high focused activities as studies.

Next section presents the major findings about reading behaviour in the online environment.

6.3. Online reading

The arrival of digital media has changed how people read. Online materials have taken a significant portion of people's reading time, time they would otherwise have spent reading printed materials. Due to the availability of vast amount of online materials, it is not difficult to imagine that browsing or scanning is becoming a primary reading pattern in today's information intensive environment. With an increasing amount of time spent on reading online materials, screen based behaviour is emerging (Liu, 2005). Many characteristics of this behaviour were revealed:

1. Skim reading / Scanning
2. Speed reading
3. Less patience
4. Distraction
5. Selective, non linear reading

Skim reading and scanning the content were the salient behavioural change identified by many respondents. The focus group participants as well as survey respondents equally agreed that they tend to skim read and scan content much more aggressively in the online environment. Out of all survey respondents, 87% indicated that they scanned content while 59% stated that they skim read. When providing feedback on their reading behaviour on both online and paper media, the majority of participants stated that they skimmed content and tried to get to the point of the document as fast as possible. Scanning content offers an effective way to do this by filtering through a vast amount of information. The high expectations in the work environment could also be a catalyst to this skimming and scanning behaviour. A participant commented: "I do more skim reading. I read to achieve work results".

The speed of reading in the online environment was also perceived. The majority of research participants commented that they read much faster online and improved their speed reading over time. Many respondents agreed that this was due to the large amount of information that is available and can be accessed in electronic format. Filtering mechanisms such as the Find/Search functions within web browsers and computer applications can be used as an aid

to this process. It is also very likely that people perform keyword spotting as a strategy to increase the speed of reading, and to locate the needed information.

One of the potential negative impacts of the online environment is its impact on natural reading pattern. Some research participants indicated that they became restless while reading online. The participants indicated that they read in small chunks and tended to skip any material that contained long paragraphs. Carr (2008) also argued that he could no longer be engaged in reading and constantly looked for other things to do. A few participants in this study also indicated pursuing similar behaviours in the online environment which strengthen Carr's argument while raising potential negative impacts of the Internet and online reading. Due to this fact, many respondents noted that online reading was less enjoyable.

As a result of graphics, video, and other commercial content, online medium reports much higher distraction levels to the readers. While some participants indicated that they did not get distracted (21%) by them, the others indicated that they always or sometimes (79%) got distracted. The proliferation of hyperlinks seemed to have a profound effect on readers' focus. While hyperlinks were used as a positive mechanism to link all relevant content and guide the readers, some people seemed to be less impressed by the fact that hyperlinks made them get lost in the pages.

The rapid growth of information and the inability to keep up with it, limit what people read. This persuades people to be more selective. The research participants identified selective nature of their reading as well as reasons for them. The purpose of reading, the time available, and the reliability of the data source were the main reasons. Flavian and Gurrea (2007) stated that the perceived reputation of the information source highly influences on people's choices. The way web content is designed and laid out also encourages non linear and selective reading. A total of 179 survey participants revealed that they scanned the content and selected what they wished to read. An equal behaviour was disclosed by 124 survey respondents for paper materials, which implies that the growth of information persuades people to be more selective in what they read.

Next sections focus on the impact of the online environment on people's reading behaviour.

6.4. Decreasing comprehension and concentration levels

The study indicated more participants reporting high to very high comprehension levels on paper materials, while there were fewer people reporting the same for online materials. The media and hyperlink-rich online content encourages more non-linear reading and allows readers to jump between content. The more links the reader encounters, the greater the potential changes to the reading path (Liu, 2005). The end result is more fragmented and shallower reading. As discussed earlier, with the ‘speed reading’, readers do not tend to spend enough time on online documents to engage with the content and think deeply about the subject. This behaviour results in lower comprehension levels. Many research participants admitted the fragmented nature of their reading in the online environment. Miall and Dobson (2006) also found that hypertext discourages the absorbed and reflective mode that characterises literary reading.

Lower attention span is also evident from the survey findings. The majority of research participants reported having high or very high concentration levels while reading paper materials. However, the numbers were significantly lower for online materials. In fact, the survey respondents indicated that they were facing low or very low concentration levels when reading online materials. Dunwoody and Eveland (2001) found that it is very difficult for readers to devote full attention to online reading because they have to decide which text to read, which link to follow, and whether to scroll down the page or not. Some participants acknowledged that they were facing decreasing in-depth reading in general. This raises a significant concern that the online reading is disrupting people’s natural sustained reading behaviour. One participant commented: “my attention span has reduced. I skip a lot of words while reading now.”

A number of participants stated that they preferred to use printed materials as opposed to online materials in order to concentrate for their work and studies. Some participants also identified how they became distracted by the other things such as emails, news, weather updates in the online environment. These days, there are many web pages and computer applications that offer popup notifications. “These features can be very useful but infuriating at the same time. Extraneous animation that is present continuously or appears suddenly can act as a distraction, interfering with users’ concentration on pertinent information” (Zhang,

2006, p.71). Although someone may argue that these externalities can bring efficiencies in the online environment, if the distraction poses a higher threat to online readers, the efficiencies will be outweighed. One participant contributed: “I think I get easily distracted if I am reading a particular topic. Thousand times I would check my emails and news”.

The study continued to identify changes to the typical reading behaviour. Due to the lower concentration levels and lower comprehension, content absorption and recall levels were affected. This demonstrates somewhat a domino effect. Next section, discusses the changes to content absorption and recall levels in detail.

6.5. Decreasing content absorption and content recall levels

Content absorption levels typically correlate with comprehension and concentration. The majority of research participants indicated high content absorption and high content recall levels on paper materials. However, a significantly low number of people recorded high content absorption and recall levels for the online environment, while increasing amounts of responses were recorded for lower content absorption and recall levels.

When the findings are observed, it is evident that people tended to skim read, scan, and pay less attention to the content they read. This pattern of reading does not allow the reader to absorb much content due to lack of time investment for in-depth reading and thinking time. As a result, the amount of information the reader can grasp will be low. Less potential to annotate or highlight the content could also be a reason for less content absorption. One respondent commented: “When I read in print, I probably focus for longer on one particular item, whereas when I read on the Web, I find that I end up moving about all over the place, to a lot of different sources in a short space of time, but I probably spend less time concentrating on and absorbing each piece of information”.

Due to lower absorption of content, the content recall levels also seemed to be lower among online readers. While the majority of survey respondents recorded having high or neutral content recall levels on the paper medium, they recorded having lower or neutral content recall levels in the online medium. Many participants stated that they could recall better on paper medium, even the page number or section of the book, due to being more absorbed in

reading the material, and not getting distracted by hyperlinks or advertisements which are commonly present in online content. Some research participants even admitted having to reread the online content several times in order to retain the information.

A number of focus group and survey participants pointed out the physical attributes of a book that helped them to recall content. One respondent commented: “With paper material I can recall it months afterwards, partly because I can recall the shape, colouring, size, thickness of the book - no such indicators exist for an online book”. The tradition of holding a book in the hand while reading, can partially explain why people tend to absorb and recall more content. Strassman (1995) also stresses that the human nervous system has a special control mechanism for the coordination of the hand with the focusing muscles of the eye.

Therefore, it seems that, although people admitted that they read more online, the content absorption and recall levels seemed to be low. RAND (2002) and Coiro (2003) argue that that online reading comprehension may require new skills and strategies to effectively use the Internet to read, comprehend, and learn new information.

6.6. Lower Relaxation Levels

Low relaxation levels within online reading environment were also present. The majority of the research study participants agreed for being very relaxed while reading on paper, while significantly fewer people agreed to the same argument for reading online materials. The research participants indicated that reading on a screen put strain on their eyes therefore it made them tired rather than relaxed. Office based staff may find it tiring to stare at a screen, after having to sit in front of a computer screen all day during business hours.

The general perception of having to sit in front of a computer and the related physical discomfort also creates low relaxation levels when reading online. Although laptop users may have the opportunity to take their online reading to a comfortable place (e.g. bed, couch), the weight, heat, and noise that the laptop creates hinder the relaxed reading experience. A participant commented: “the glare of the screen, the computer chair is not as comfy as bed or the sofa”.

Many research participants revealed that they printed materials out to read at home or when commuting. This is also identified as a commonly followed reading behaviour. The next section discussed the main findings in detail.

6.7. Printing for reading

Most readers view online articles on the screen, print them out and then read as printed materials (Rho & Gedeon, 2000). Out of all survey participants, a large amount (72%) indicated that they printed out materials to read. The printing may partially relate to the relaxation levels as well as the convenience factors such as portability.

Numerous participants indicated holding on to a paper was important for them as reading had such a close bond with paper materials. As indicated earlier, Strassman (1995) has found coordination between the human eye and hand. Many research respondents admitted that they printed materials to read as it helped them to focus more. The important thing to note is the people repeatedly acknowledged that they tended to read small amounts of data on screen and started to print only when the content became either too long or too complicated. One survey respondent commented: “I do not like reading on line and print out most documents which are two or more paragraphs long”.

The points discussed above revealed an interesting insight to the people’s reading behaviour in the information age. The next section attempts to explore these findings from a theoretical point of view. The majority of the behavioural changes identified above are related to processing of information and human cognition. Therefore, the Staged Model of Information Processing was chosen as the framework to discuss the major findings.

6.8. Theoretical View

The Staged Model of Information Processing presents a clear explanation for the low content absorption and recall levels of the online readers.

According to theorists Atkinson and Shrifin (1968), information is processed and stored in three stages. These stages are of memory are: sensory, short term, and long term. Figure 20 below illustrates the Stage Model of Information Processing.

Sensory registers are the part of memory that receives all the information a person senses (light, sound, smell, heat, cold). The body has special sensory receptor cells that transduce this external energy to something the brain can understand. In the process of transduction, a memory is created. This memory is very short and lasts for less than a half second for vision and about three seconds for hearing. Short term memory, which is also called working memory, is the part of memory where new information is held until it is either lost or placed into the long term memory. This memory will initially last somewhere around 15 to 20 seconds unless it is repeated, at which point it may be available for up to 20 minutes. There are two major concepts for retaining information in short term memory: organisation and repetition. The long term memory has an unlimited capacity and holds information indefinitely (Huitt, 2003).

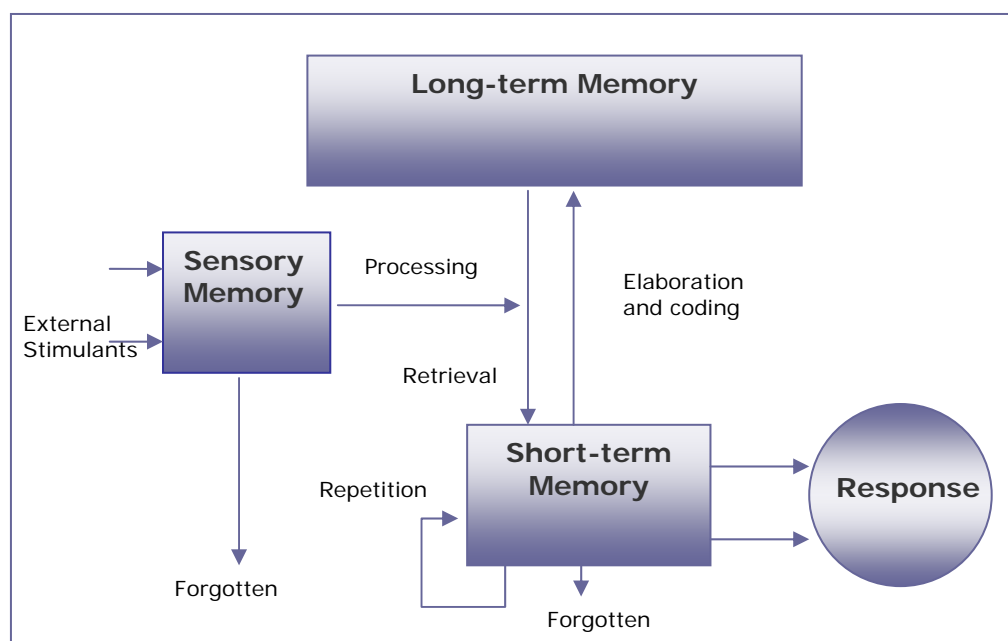


Figure 20 – Staged Model of Information Processing Theory (Based on Huitt, 2003)

As illustrated in Figure 20 above, memory generates within sensory memory and gets transferred to short-term memory where it lives until the memory gets coded to long term memory or gets forgotten as a result of no repetition. There are many techniques to improve retaining information in the short term memory. “Chunking is a major technique for getting and keeping information in short-term memory; it is also a type of elaboration that will help get information into long-term memory (Hewitt, 2003, p.3)”.

Most of the online materials are designed to be in small chunks. Some content is also laid out in effective ways. These organisation techniques help readers to retain content in their short term memory. However, when readers skim read they tend to skip some of the words, therefore the content that gets absorbed to the short term memory is not complete. According to Miller (1956) the number of units that can be processed in short term memory is 7 ± 2 . When people tend to skim read and speed read, the amount of information that get absorbed via sensory memory can easily exceed this number of units. It is also important to note that the content that gets absorbed to the sensory memory could be more, depending on what other receptors sense at the same time. As indicated by the survey participants the distraction that occurs in the online environment could also hinder this process. Moreover, the greater percentage of day to day documents will be read only one time. Therefore the other technique, repetition, will also not be used very often. As a result, the probability of content absorption can be lesser compared to the sustained reading that occurs when reading paper materials.

Skim reading may also factor into less comprehension. As survey respondents stated, they tended to skim read fast to get to the point rather than reading in a linear fashion. Multi-tasking while using computers also distracts the focus, hence comprehension. The physical discomforts potentially contribute to lack of concentration. The majority of online readers do not have the option to use devices such as e-readers, therefore having to sit at the desk while reading online materials. Moreover, the office environment generally does not give more freedom for people to read away from their work stations. Research participants repeatedly stated that having to stare at a screen for long periods tired their eyes.

Therefore, it seems that all these factors negatively impact on people’s cognition while reading online and recalling that information. The medium indeed has an effect on people’s reading comprehension, concentration, content absorption, and recall. Hsieh and Dwyer

(2009) studied the effectiveness of various online reading strategies including rereading to identify the best strategy to enhance comprehension. Leu and Zawilinski (2007) identified that people require new online reading strategies and skills in order to achieve the same level of comprehension that occurs through paper materials.

The findings from both phases address the objectives set for this research study. The study explored online and offline reading behaviours of individuals. While there were commonalities in reading for each medium (e.g. reading time, location), there were significant differences (e.g. type of material, reading patterns) as well. The empirical evidence justified and extended the current academic literature on reading. A number of critical impacts of the online environment on individuals' reading behaviour were also evident through the findings. One of the implications noted through the analysis of data was the significance of reading skills for individuals in the information age. As suggested by Leu and Zawilinski (2007) people require online reading strategies and skills to achieve similar levels of reading experience as on paper. The online readers need to control the distractions and devote more effort to focus on the content. When we read paper based materials, we tend to avoid distractions by going to a quiet place. Similarly, people need skills to filter out distractions such as banner advertisements that hinder sustained reading. Some research participants revealed that they have mastered this skill therefore they can concentrate on the online content much easier. People also need information literacy skills to choose the right amount of relevant information in online environment. This should minimise the impatience research participants felt having to deal with the enormous amount of online materials. Educators can include these skills in the curricular especially for younger generations who tend to have more exposure to online materials. Although there are limitations with technology (i.e. screen size and glare), it is continuously evolving to be better. Devices such as e-readers and iPads have attempted to deliver a better reading experience to their users. As discussed in the Transaction Theory, people and reading will always work their effects upon each other and will be better day by day.

Since the early civilizations humans have come a long way, surviving and developing for centuries. They are amazing learners, adaptable, and able to accustom themselves to almost any circumstances (Savage & Kanazawa, 2004). Therefore, with guidance, people will learn skills to minimise the constraints of the online environment in order to achieve maximum potentials.

7. Conclusion and Implications

Advancements in technology and the development of the Internet have affected the way in which most people and businesses work. While print still maintains its legacy, digitised information is rapidly increasing at an unprecedented pace. As a result, people are gradually adopting the online materials and developing screen based reading in the information age.

This study explored the online and offline reading behaviour of individuals, determined the underlying patterns, examined the differences between online and offline reading, and assessed the impacts of the online environment on individuals' reading behaviour. The study was conducted in two phases. Phase 1 consisted of two focus groups which explored the online and offline reading behaviour of individuals and provided a variety of opinions and perspectives. Phase 2 consisted of an online survey which was mainly aimed as a confirmatory activity for Phase 1 as well as to obtain any additional findings which were not uncovered in Phase 1. Focus Groups 1 and 2 contained six and seven participants respectively, while the online survey was completed and submitted by over 200 participants from all over the world.

The findings indicated that people chose to read for several reasons. Knowledge, escapism, pleasure, obligation, mood change, and physical need were the key reasons for people to read paper materials. Larger choice, efficiency, accessibility, low cost, up-to-date information, interactivity/features, and environmental considerations were the top most reasons for why people preferred the online materials. The participants indicated that they read books, business documents, newspaper, magazines, and academic literature on paper while they read websites, business documents, online newspapers, and magazines online. The time of the day people read paper materials ranged from morning until the bed-time and a significant amount of that reading was carried out during business hours as part of work. Online materials were also read throughout the day but there were considerably fewer people who read online materials before going to bed. Home and work were the two main locations people read their paper materials. However, a significant number of people also read during commuting and at the library. People read the most amounts of online materials at work, while home, library, and travel were respectively the next most common places to read.

The research participants revealed a combination of reading patterns for both online and offline materials. In general, participants read paper materials quite intensively, reporting a linear pattern as the most common way of reading. Scanning content and reading only the interesting articles, was also a popular behaviour among readers. The online environment was mainly dominated by non linear reading patterns. Scanning and skim reading were the most commonly adopted reading behaviours online. A low number of people recorded that they followed a linear online reading pattern and read from start to finish.

The comparison of media provided a fascinating insight into individuals' reading. The research participants acknowledged that they perceived changes to the way they read and how they felt while reading online and paper materials. The results indicated lower comprehension and concentration levels with online materials compared to paper materials. The respondents indicated low content absorption and recall on online materials as opposed to paper materials. People admitted that they feel much more relaxed when reading on paper as opposed to reading on screen and justified their responses by indicating physical discomforts and lack of portability of online materials. The impacts of the new medium were evident during the analysis. People have developed skim reading and scanning skills which helped them to get through more content by using speed reading. However, shorter attention spans were repeatedly reported by participants and, as a consequence, low concentration, and shallower reading behaviour were revealed. The analysis indicated that increasing skim reading and filtering content resulted in lower comprehension and content absorption, which ultimately resulted in lower recall levels. It was also revealed that the majority (72%) of participants printed out online documents for reading.

This study explored and validated that online reading behaviour is quite different from offline reading and has its own implications. It is evident that online reading has an impact on individuals' reading behaviour and people seem to demonstrate different reading patterns on each medium. The results raise concerns in terms of human cognition and recognise the need for skills and reading strategies to overcome the concerns and develop better online reading behaviour.

The findings from this research study demonstrate values for both academics and practitioners. This study contributes to extend and enhance the current academic literature on online reading by providing empirical evidence. As a result, educators and authors will be

better informed on users' reading behaviour and benefit when designing reading materials. The individuals will understand the impact of the Internet and online reading and how to respond to the negative impacts which were identified. It can be assumed that the participation on a global scale provided a sensitive measure for anticipating reading behaviour in the online environment.

7.1. Limitations and suggestions for future research

The scope of this research project did not allow entering specifics of the online media (e.g. emails, blogs); it rather obtained a holistic view of the online environment and its impact on human reading behaviour. However, the findings proved that the online environment creates a significant impact on individuals' reading behaviour which needs to be considered by academics, practitioners, and the individuals themselves. Therefore, this study opens up many potential research directions for the future.

Future research can be extended to obtain more scientific evidence (e.g. brain scanning) to justify these findings. The experiments can be done to compare brain activity in online and offline environment and to identify the impact of online reading behaviour on individuals' comprehension and content recall levels.

The new research can also focus on psychological impacts of the online reading environment. The low concentration, comprehension, and content absorption/recall levels might have an impact on individuals', especially students', performance and achievement levels which will ultimately result in low self esteem and potential psychological consequences.

It would also be fascinating to find out whether the latest addition to the online reading devices, the iPad, influences or alters the online reading behaviour. This research can also be repeated in few years to study people's adaptation to the online environment.

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9. Appendices

9.1. *Data Collection Phase 1*

9.1.1. Information Sheet

Project Title: How do we read online: The effect of the Internet on reading behaviour

Researcher: Channa Herath

I am a Master of Information Management student in the School of Information Management at Victoria University of Wellington. As part of my study, I am undertaking a research project. This research is to examine how 'online' reading has impacted on reading behaviour.

Research Objectives

The objectives of this research are to;

- (1) Explore the online reading behaviour of individuals
- (2) Determine underlying patterns
- (3) Explore offline reading behaviours
- (4) Determine the differences between online and offline reading, and the impact of the online environment on that.

It is expected that these research objectives will have both academic as well as practical benefits. Research findings would contribute to the current academic literature concerning online reading and its impact on reading behaviour in general. Educators would benefit from the research outputs by being able to design and produce better online training materials. Web publishers and authors would also benefit by understanding people's reading patterns on the Internet and thus being able to produce better online materials. Individuals would benefit by understanding the impact of the Internet on their reading and how to respond to those impacts.

In order to carry out this research, the University requires ethical approval to be obtained from the participants.

Focus Group Sessions

My research will consist of two parts:

- (1) Phase 1 - Two focus groups
- (2) Phase 2 - An online survey

The Phase 1 focus groups will take place in January/February 2010. The Phase 2 online survey will be conducted in February 2010 and will be based on the findings of the focus groups.

If you choose to participate in this research, you will be part of a group along with 6-8 other participants where you will have the opportunity to discuss your views and experiences

relating to reading online. It is expected that the focus group discussion will last between 1-1.5 hours.

Each focus group will be recorded on video for use in analysing the data. Using a video recording will preserve a range of details such as who is speaking, body language, and non-verbal responses that take place during the discussion which will be a significant memory aid during the analysis stage.

Confidentiality

All responses will be confidential and will only be reported in an aggregated way or in a way where individuals will not be able to be identified. In order to protect the privacy of all participants in the group, it is essential that the discussions that take place during the session are kept confidential by all participants.

All electronic data will be kept in a password protected file. Any written material will be kept in a locked cabinet. All material will be kept confidential, and will only be seen by me, and my supervisor, Dr. Val Hooper. The research project will be submitted for marking to the School of Information Management and a copy deposited in the University Library. It is also intended to submit articles based on the findings for publication in academic journals. All raw data from the focus groups, including video tapes and video files, will be destroyed two years after the conclusion of the research project.

Withdrawal from Study

In the event of a decision to withdraw, the participant must inform the researcher at least two days prior to commencement of the focus group and that information already provided (i.e. participant's details) if any, will be deleted.

Contact

A summary of the focus group results will be available after the data from both focus groups have been analysed. If you wish to receive this summary, and/or a copy of the final report of the research project, please indicate on the consent form and provide an email address where it can be sent.

If you have any questions or would like further information about the project, please contact me or my supervisor:

Channa Herath	herathdham@myvuw.ac.nz	(04) 894 5531
Dr. Val Hooper	Val.Hooper@vuw.ac.nz	(04) 463 5020

Attached, you will find a consent form, a request for contact details, and an overview of the main topics we will discuss during the focus group. If you agree to participate in the focus group, carefully read the consent form before signing it and returning it to me in either electronic or hard copy format along with the completed contact details form. I will be in touch again to verify a suitable time for the focus group session.

Thank you,

Dhammika Channa Herath

9.1.2. Consent Form

How we read online: The effect of the Internet on reading behaviour

Please indicate your acceptance of each term by placing a tick mark in the box next to the statement.

- ☐ I have been provided with adequate information relating to the nature and objectives of this research project. I have understood that information and have been given the opportunity to seek further clarification or explanations.
- ☐ I understand that the focus groups will be video recorded.
- ☐ I understand that any information or opinions I provide will be kept confidential and reported only in an aggregated / non-attributable form.
- ☐ I understand that I must keep the discussions of the focus group confidential and may not disclose what others have said during the focus group session.
- ☐ I understand that the information I have provided will be used only for the purposes stated in the information sheet.
- ☐ I understand that when this research is completed the information obtained will be destroyed two years after the conclusion of the research project.
- ☐ I would like to receive a summary of the results of Phase 1 after both focus groups have been completed.

Please provide an email address: _____

- ☐ I would like to receive a copy of the final report of this research project.

Please provide an email address: _____

- ☐ I agree to take part in this research.
- ☐ I understand that I may only withdraw from participating in the focus group two days before the session starts.

Name: _____

Signature: _____

Date: _____

9.1.3. Focus Group Questions

Reading on paper

1. What do you typically read in paper version in terms of (a) format, e.g. magazine, newspaper, and (b) content?
2. Why do you read?
3. Where do you typically read?
4. When do you read?
5. How do you read? (i.e. where do you start, do you skim read, do you jump to certain parts, etc?)

Reading online (Screen and the Internet)

6. If you read online, what device(s) do you use for reading?
7. What do you typically read in terms of (a) format, e.g. magazine, newspaper, and (b) content?
8. Why do you read online?
9. Where do you typically read?
10. When do you read?
11. How do you read, i.e. where do you start, do you skim read, do you jump to certain parts, etc?

Comparison

12. What do you think of reading online as opposed to reading on paper?
[Explore benefits, disadvantages]
13. Have you noticed a difference between the way you read online and the way you read from paper?
14. Has the amount of your reading changed, i.e. do you read more due to the availability of electronic material?
15. Which medium do you prefer?

9.2. Data Collection Phase 2

9.2.1. Information Sheet

Researcher: Dhammika Channa Herath

I am a Masters student in Information Management at Victoria University of Wellington, New Zealand. As part of my degree, I am undertaking a research project to examine how online reading has impacted reading behaviour.

Findings of the research are expected to provide both academic and practical benefits. Educators will benefit by being able to design and produce better online training materials. Web publishers and authors will also benefit by understanding people's reading patterns on the Internet thus being able to produce better online materials. Individuals will benefit by understanding the impact of the Internet on their reading and how to respond to that.

I have already gained the support of the University by obtaining approval from the School of Information Management's Human Ethics Committee. All responses will be completely anonymous and the information you provide and all written material will be kept secure and confidential in a password protected file and will only be reported in an aggregated way. To ensure participant anonymity, the survey software will not collect information such as IP addresses that could individually identify participants. The report will be submitted for marking to the School of Information Management and will be deposited in the University Library. It is intended that one or more articles on the research and findings may be submitted for publication in scholarly journals.

It is anticipated that the questionnaire will take between 10-15 minutes to complete. At the end of the survey you will be provided with access to another link where you can indicate whether you wish to go into a lucky draw for one of three \$50 book vouchers, as well as whether you wish to receive a summary report on the findings of the research.

Although participation is completely voluntary, I hope you will take time to complete this survey. The survey will be available for completion until 22nd April 2010. Submitting this survey will indicate your consent to participation.

If you have any questions, please don't hesitate to contact me at herathdham@vuw.ac.nz or my supervisor, Dr. Val Hooper, at val.hooper@vuw.ac.nz or telephone (04) 4635020.

Thank you for your consideration.

9.2.2. Online Questionnaire

While answering this questionnaire please focus on your experience of typical reading materials such as books, magazines, newspapers rather than advertisements, text messages, and emails.

Reading

This section focuses on reading in general.

1. Why do you read? Please select all that apply. [check boxes]

	Paper	Online
For pleasure	<input checked="" type="checkbox"/>	<input type="checkbox"/>
For inspiration	<input type="checkbox"/>	<input type="checkbox"/>
As a lifestyle choice	<input type="checkbox"/>	<input type="checkbox"/>
To escape	<input type="checkbox"/>	<input type="checkbox"/>
To have personal space	<input type="checkbox"/>	<input type="checkbox"/>
Not having to interact with others	<input type="checkbox"/>	<input type="checkbox"/>
Must read for work, study etc.	<input type="checkbox"/>	<input type="checkbox"/>
Because I paid for the material	<input type="checkbox"/>	<input type="checkbox"/>
Not to waste time	<input type="checkbox"/>	<input type="checkbox"/>
To change my mood	<input type="checkbox"/>	<input type="checkbox"/>
To relax	<input type="checkbox"/>	<input type="checkbox"/>
To seek information	<input type="checkbox"/>	<input type="checkbox"/>
For studies	<input type="checkbox"/>	<input type="checkbox"/>
Feel fidgety if I don't read	<input type="checkbox"/>	<input type="checkbox"/>
To reward myself	<input type="checkbox"/>	<input type="checkbox"/>
Because of the large choice	<input type="checkbox"/>	<input type="checkbox"/>
Because it's available	<input type="checkbox"/>	<input type="checkbox"/>
Because it's free	<input type="checkbox"/>	<input type="checkbox"/>
Because it's accessible	<input type="checkbox"/>	<input type="checkbox"/>
Not having to go to the library	<input type="checkbox"/>	<input type="checkbox"/>
Not having to return the books	<input type="checkbox"/>	<input type="checkbox"/>
To save time	<input type="checkbox"/>	<input type="checkbox"/>
To have more control over my reading	<input type="checkbox"/>	<input type="checkbox"/>
Because I can interact	<input type="checkbox"/>	<input type="checkbox"/>
Because there are aggregated articles	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify) [text input]	<input type="checkbox"/>	<input type="checkbox"/>
<input type="text"/>		

2. When you think of reading, what thoughts come to mind? [text input]

Reading on paper

This section is about your reading habits and experiences with paper based materials. Paper materials **include** books, newspapers, magazines, journals, and other such documents.

3. What do you typically read in paper format? [\[check box\]](#)

	Number of hours per week
Books	
Magazines	
Newspapers	
Business documents	
Other (Please specify) [text input]	
<input type="text"/>	

4. Where do you typically read? [\[check box\]](#)

	Number of hours per week
At home	
At work	
While travelling (e.g. in the bus, train)	
At the library	
Other (Please specify) [text input]	
<input type="text"/>	

5. When do you read? [\[check box\]](#)

- Morning
- Afternoon
- Mealtimes
- Evening
- Before going to bed
- Other (Please specify) [\[text input\]](#)

6. When reading paper based materials, in general, how would you describe the way you read? Select one or more answers. [\[check box\]](#)

- I start from the beginning and read to the end
- I skim read
- I scan the content and read only the content that interests me
- I read the first part and skip to the last part.
- Other (Please specify) [\[text input\]](#)

7. Do you print out material to read? [\[radio button\]](#)

- Yes
- No

If yes, why do you print? [text input]

Reading online (Screen and the Internet)

This section is about your reading habits/experiences with online materials. Online reading **includes** material that you read on screen while on or off the Internet such as web pages, online journals, online news papers, downloaded online material such as electronic journals, and other such documents.

8. What device(s) do you use for reading? [check box]

- Computer
- Laptop
- Mobile Phone
- E-reader
- Other (Please Specify)

9. What do you typically read online? [check box]

	Number of hours per week
Books	
Magazines	
Newspapers	
Business documents	
Internet pages (e.g. blogs, wikis, forums)	
Other (Please specify) [text input]	
<div style="border: 1px solid black; width: 150px; height: 15px;"></div>	

10. Where do you typically read? [check box]

	Number of hours per week
At home	
At work	
While travelling (e.g. in the bus, train)	
At the library	
Other (Please specify) [text input]	
<div style="border: 1px solid black; width: 150px; height: 15px;"></div>	

11. When do you read? [check box]

- Morning
- Afternoon
- Mealtimes
- Evening
- Before going to bed
- Other (Please specify) [text input]

12. In terms of reading online, in general, how do you describe the way you read? [check box]

- I start from the beginning and read to the end
- I skim read
- I scan the content and read only the content that interests me
- I read the first part and skip to the last part.
- Other (Please specify) [text input]

Comparison

This section focuses on your experience of paper vs. online reading.

13. Has the amount of your reading changed, i.e. do you read more due to the availability of online material? [radio button]

- Yes
- No

Please provide any comments you may want to add. [text input]

14. How would you rate your level of **comprehension** while reading? [scale]

	Very Low					Very High
Paper based material	<input type="radio"/> 1	<input type="radio"/> 2	<input checked="" type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	
Online material	<input type="radio"/> 1	<input type="radio"/> 2	<input checked="" type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	

15. How would you rate your level of **concentration** while reading? [scale]

	Very Low		Very High		
Paper based material	<input type="radio"/> 1	<input type="radio"/> 2	<input checked="" type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Online material	<input type="radio"/> 1	<input type="radio"/> 2	<input checked="" type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

16. How would you rate your level of **absorption** of the content while reading? [scale]

	Very Low		Very High		
Paper based material	<input type="radio"/> 1	<input type="radio"/> 2	<input checked="" type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Online material	<input type="radio"/> 1	<input type="radio"/> 2	<input checked="" type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

17. How would you rate your level of content **recall** of the content after two weeks? [scale]

	Very Low		Very High		
Paper based material	<input type="radio"/> 1	<input type="radio"/> 2	<input checked="" type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Online material	<input type="radio"/> 1	<input type="radio"/> 2	<input checked="" type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

18. How **relaxed** do you feel while reading? [scale]

	Not relaxed		at all		Very relaxed
Paper based material	<input type="radio"/> 1	<input type="radio"/> 2	<input checked="" type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Online material	<input type="radio"/> 1	<input type="radio"/> 2	<input checked="" type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

19. Do you get distracted by the links, advertisements, and colours of digital materials? [radio button]

- Yes
- No
- Sometimes
- Not applicable

20. Have you noticed a difference between the way you read online and the way you read on paper? [radio button]

- Yes

- No

If yes, what differences have you noticed? [text input]

21. Over the past few years, have you noticed any changes to the way you read in general? [radio button]

- Yes
- No

If yes, what has changed?

22. How do you feel when you read online vs. paper materials? [text input]

23. Which medium do you prefer? [check box]

- Paper
- Online
- Neither, i.e. I like them equally

Please add any comments that support your choice. [text input]

Demographics

This section collects some of the demographic details of the respondents. Please note that these responses will be used only in aggregated form.

24. Please select your age group [\[radio button\]](#)

- 18-29
- 30-39
- 40-49
- 50+

25. Your gender [\[radio button\]](#)

- Male
- Female

26. Your primary language [\[radio button\]](#)

- English
- Other

27. Please select the reading material format(s) that you use [\[check box\]](#)

- Paper
- Online (i.e. electronic journals, web pages)

28. On average, how many hours do you spend reading paper based materials per week? (e.g. books, newspapers, magazines, etc.) [\[radio button\]](#)

Hours	For work	For pleasure
1-5	<input checked="" type="radio"/>	<input checked="" type="radio"/>
6-10	<input type="radio"/>	<input type="radio"/>
11-15	<input type="radio"/>	<input type="radio"/>
16+	<input type="radio"/>	<input type="radio"/>

29. On average, how many hours do you spend reading online per week? (e.g. books, newspapers, news, electronic journals, etc.) [\[radio button\]](#)

Hours	For work	For pleasure
1-5	<input checked="" type="radio"/>	<input checked="" type="radio"/>
6-10	<input type="radio"/>	<input type="radio"/>
11-15	<input type="radio"/>	<input type="radio"/>
16+	<input type="radio"/>	<input type="radio"/>


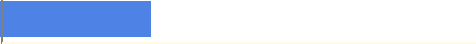


30. Please choose the number of years of online experience you have [\[radio button\]](#)

- Less than 3 years
- 3-10 years
- 11-20 years
- More than 20 years



9.3. Survey Responses

9.3.1. Demographics

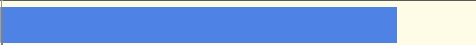

Age

#	Answer		Response	%
4	18-29		47	23%
1	30-39		63	31%
2	40-49		46	23%
3	50+		46	23%
	Total		202	100%

Gender

#	Answer		Response	%
1	Male		71	35%
2	Female		131	65%
	Total		202	100%

Primary language

#	Answer		Response	%
1	English		167	83%
2	Other		34	17%
	Total		201	100%

Reading material format(s) that you use

#	Answer		Response	%
1	Paper		189	95%
2	Online (i.e. electronic journals, web pages)		189	95%

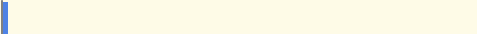



Number of hours spent reading paper based materials per week

#	Question	1-5	6-10	11-15	16+	Responses	Mean
1	For work	102	46	20	22	190	1.80
2	For pleasure	74	63	32	21	190	2.00

Number of hours spent reading online materials per week

#	Question	1-5	6-10	11-15	16+	Responses	Mean
1	For work	61	68	23	38	190	2.20
2	For pleasure	103	46	20	9	178	1.63

Number of years of online experience

#	Answer		Response	%
1	Less than 3 years		3	1%
2	3-10 years		57	28%
3	11-20 years		108	54%
4	More than 20 years		33	16%
	Total		201	100%

9.3.2. Reading

Why do you read? Please select all that apply.

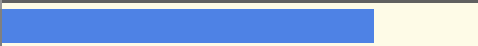
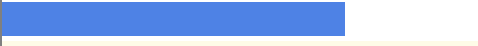
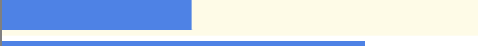



#	Question	Paper	Online	Responses
1	For pleasure	209	117	326
2	For inspiration	143	135	278
3	As a lifestyle choice	132	86	218
4	To escape	152	55	207
5	To have personal space	122	53	175
6	Not having to interact with others	70	42	112
7	Must read for work, study etc.	167	204	371
8	Because I paid for the material	54	24	78
9	Not to waste time	32	62	94
10	To change my mood	75	50	125
11	To relax	150	60	210
12	To seek information	158	222	380
13	For studies	118	144	262
14	Feel fidgety if I don't read	60	33	93
15	To reward myself	111	46	157
16	Because of the large choice	44	65	109
17	Because it's available	79	127	206
18	Because it's free	66	132	198
19	Because it's accessible	70	160	230
20	Not having to go to the library	10	89	99
26	Not having to return the books	10	79	89
21	To save time	13	107	120
22	Because I have more control over my reading	51	53	104
23	Because I can interact	9	54	63
24	Because there are aggregated articles	10	66	76
25	Other (Please specify)	5	8	13

When do you read?

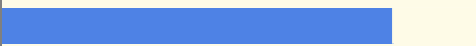




#	Answer	Response	%
1	Morning	164	78%
2	Afternoon	150	72%
4	Mealtimes	84	40%
3	Evening	159	76%
5	Before going to bed	158	76%
6	Other (Please specify)	14	7%

9.3.3. Reading on paper

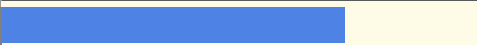

When do you read?

#	Answer		Response	%
1	Morning		164	78%
2	Afternoon		150	72%
3	Mealtimes		84	40%
4	Evening		159	76%
5	Before going to bed		158	76%
6	Other (Please specify)		14	7%

When reading paper based materials, in general, how would you describe the way you read? Select one or more answers.

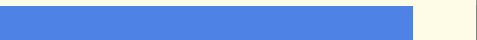





#	Answer		Response	%
1	I start from the beginning and read to the end		172	82%
2	I skim read		86	41%
3	I scan the content and read only the content that interests me		124	59%
5	I read the first part and skip to the last part.		23	11%
4	Other (Please specify)		22	11%

Do you print out material to read?

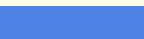

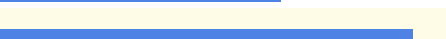


#	Answer		Response	%
1	Yes		150	72%
2	No		57	28%
	Total		207	100%

9.3.4. Reading online






When do you read?

#	Answer		Response	%
1	Morning		176	87%
2	Afternoon		163	81%
6	Mealtimes		45	22%
3	Evening		150	74%
4	Before going to bed		62	31%
5	Other (Please specify)		4	2%

In terms of reading online, in general, how do you describe the way you read?

#	Answer		Response	%
1	I start from the beginning and read to the end		63	31%
2	I skim read		119	59%
3	I scan the content and read only the content that interests me		176	87%
5	I read the first part and skip to the last part.		19	9%
4	Other (Please specify)		10	5%

What device(s) do you use for reading?

#	Answer		Response	%
1	Computer		161	80%
2	Laptop		130	64%
3	Mobile Phone		25	12%
4	E-reader		4	2%
5	Other (Please Specify)		17	8%

9.3.5. Comparison of online vs. paper materials

Has the amount of your reading changed, i.e. do you read more due to the availability of electronic material?

#	Answer		Response	%
1	Yes		133	66%
2	No		70	34%
	Total		203	100%

Do you get distracted by the links, advertisements, and colours of digital materials?

#	Answer		Response	%
1	Yes		57	29%
2	No		41	21%
3	Sometimes		102	51%
	Total		200	100%

Level of comprehension while reading

#	Question	Very Low	Low	Neither Low nor High	High	Very High	Responses	Mean
1	Paper based material	0	9	22	111	60	202	4.10
2	Online material	2	14	62	94	28	200	3.66

Level of concentration while reading

#	Question	Very Low	Low	Neither Low nor High	High	Very High	Responses	Mean
1	Paper based material	0	8	26	107	61	202	4.09
2	Online material	3	34	72	79	12	200	3.32

Level of content absorption while reading

#	Question	Very Low	Low	Neither Low nor High	High	Very High	Responses	Mean
1	Paper based material	1	3	33	115	49	201	4.03
2	Online material	3	25	81	80	10	199	3.35

Level of content recall while reading

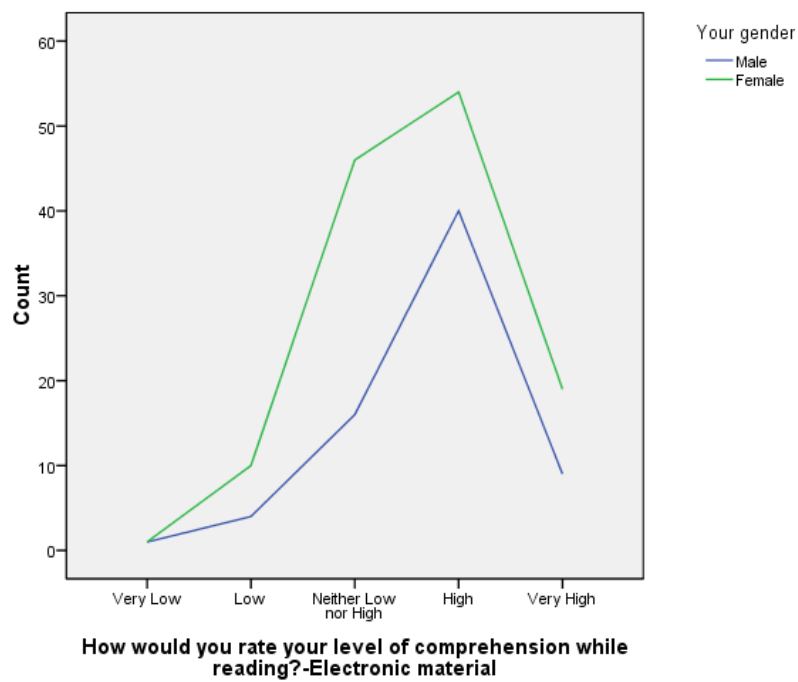
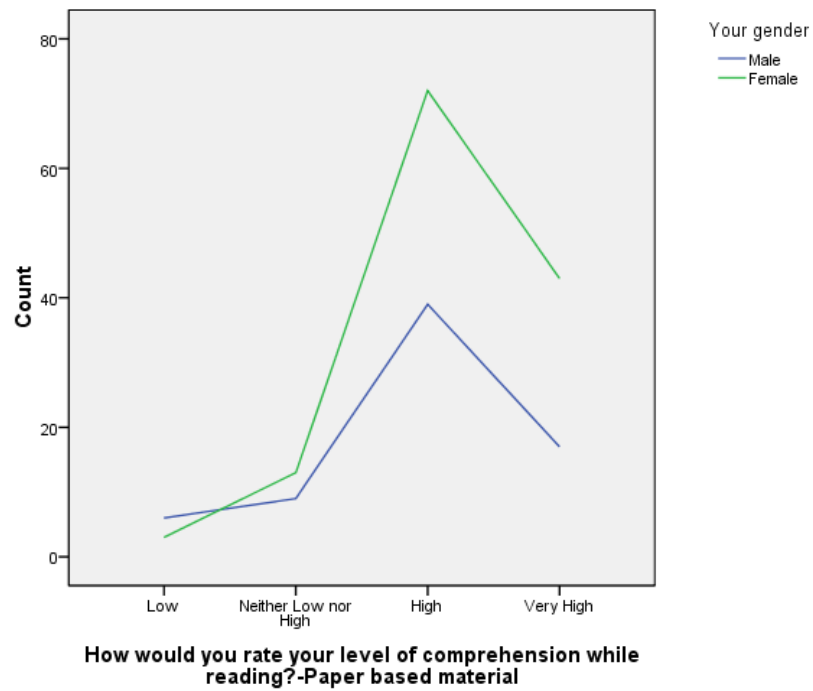
#	Question	Very Low	Low	Neither Low nor High	High	Very High	Responses	Mean
1	Paper based material	0	20	67	98	17	202	3.55
2	Online material	4	43	86	62	5	200	3.11

Level of relaxation while reading

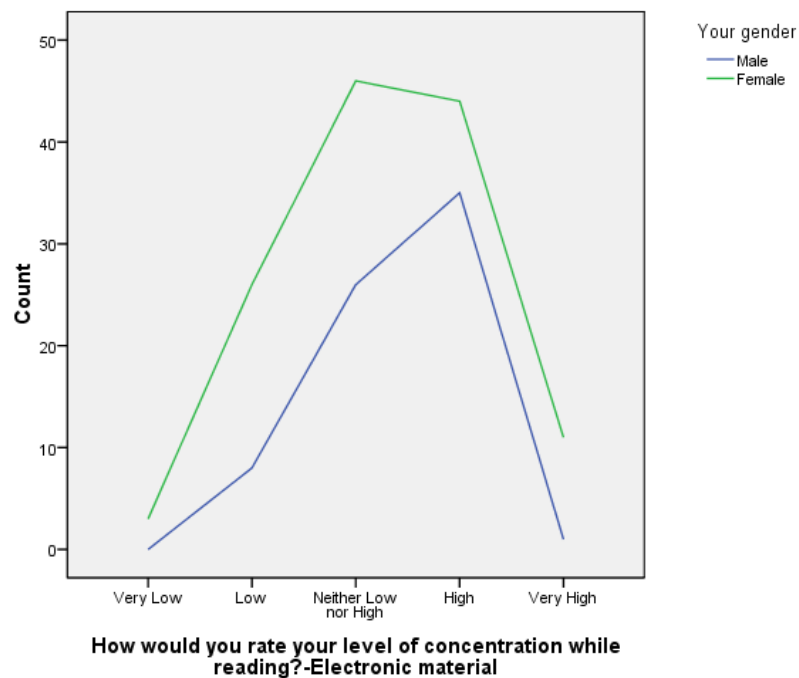
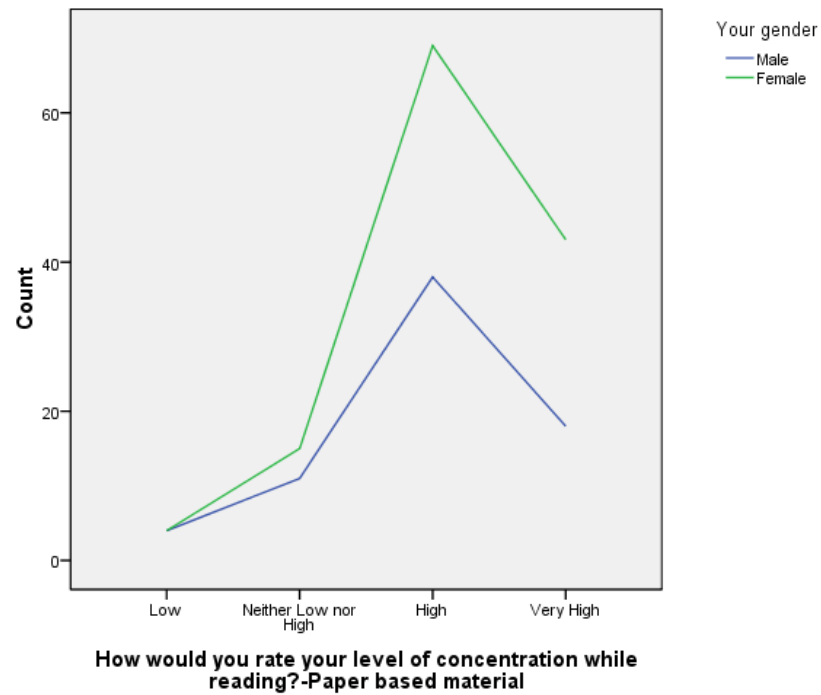
#	Question	Not relaxed at all	Unrelaxed	Neither relaxed nor unrelaxed	Relaxed	Very relaxed	Responses	Mean
1	Paper based material	0	3	21	109	69	202	4.21
2	Online material	5	42	87	52	14	200	3.14

9.4. Data Analysis

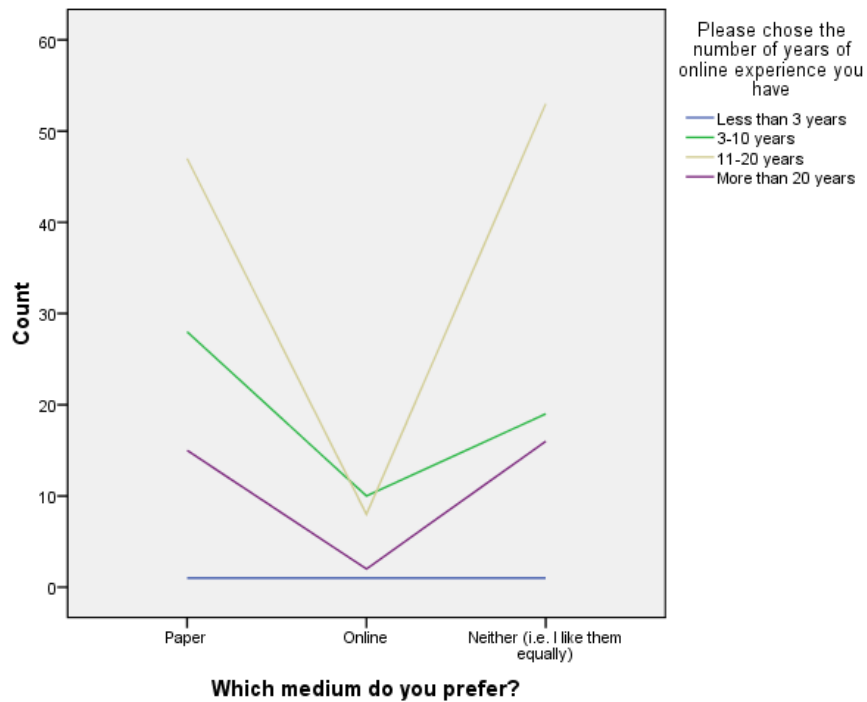
9.4.1. Comprehension levels by gender



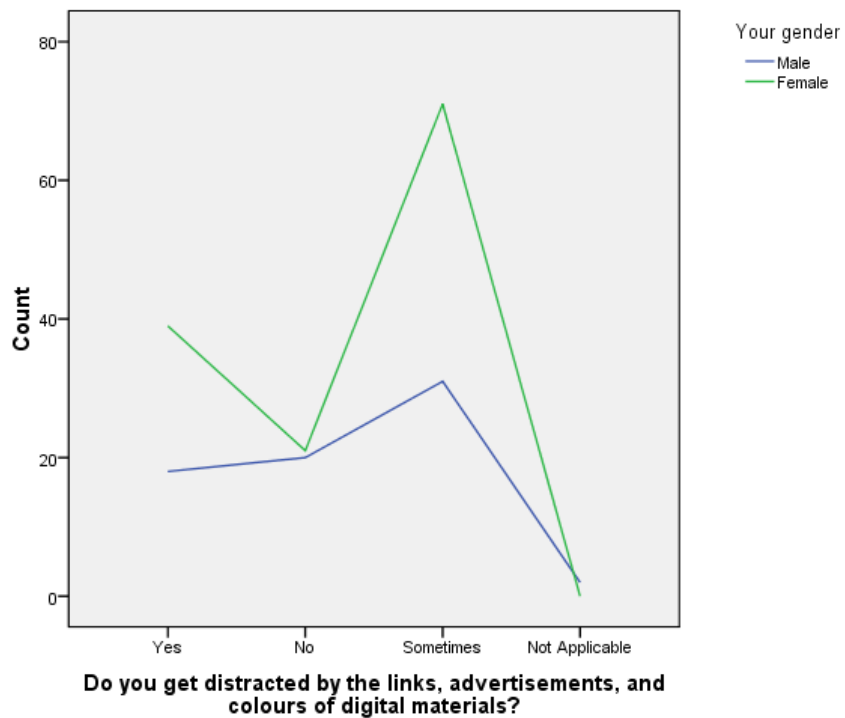
9.4.2. Concentration levels by gender



9.4.3. Preference of medium by the Internet experience



9.4.4. Distraction in online environment by gender



9.5. Prize Draw for Three Book Vouchers

The prize draw for three Book Vouchers was drawn on **31 May 2010**.

Three lucky winners were chosen out of 164 respondents who entered the competition. All respondents were notified via emails.

‘The Hat’ computer software which randomly selects names from a given list was used to pick the winners. The process was video recorded and uploaded to YouTube. A link was included in the email notification. The aim of the video was to demonstrate integrity.

