

# **Exploring the usefulness of e-book readers for academic staff**

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## **Abstract**

This study investigates the usefulness of e-book readers as aids for academic staff in their work. Text used in Higher Education (HE), such as journal articles, reports, committee papers and students' assignments is often available, distributed and stored in digital format. Academic staff carry large quantities of printed documents with them in their day-to-day work. E-ink is a display technology that mimics the appearance of printed text (Siegel, 2009), and is promoted as a feasible alternative to print, making digital documents more portable and flexible to use, wherever and whenever academic staff need them. This exploratory study uses a case study approach. Participants, academic staff of Kingston University, were recruited on a voluntary basis and given an e-book reader to make use of it or their academic work for a period of four weeks. The main source of data collection was semi-structured interviews, conducted at the end of the trial. The study, the data collection and analysis, and reporting, were structured with the help of a theoretical framework activity theory (Engeström, 1987). As a result, participants saw e-book readers in the context of HE as useful for disposable text related to leisure reading. Participants were less convinced about the usefulness of e-book readers for everyday tasks related to academic reading, mainly because the routines, habits and conventions that accompany academic reading were more difficult to accommodate with e-book readers. The originality of this study will be found in the exploration of the usefulness of e-book readers to academic staff, and the study supports and challenges some of the findings found in the context of teaching and learning.

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## **1. Introduction**

An e-book reader is a paper book simulator which displays digital text that bears close resemblance to normal print using the E-ink technology (Siegel, 2009; Young, 2006). E-book readers could offer academic staff many advantages, because academic texts such as journal articles and committee papers are digitally available, and as e-book readers are lightweight, portable and capable of storing large quantities of text, they offer academics the freedom to read wherever and whenever they want.

Early studies investigated the usefulness of small handheld devices to students, for reading academic text (Marshall & Ruotolo, 2002). Portable reading devices, especially e-book readers, in education, have gained increasing attention over the last couple of years (e.g. Horizon, 2010; 2011). Several studies have looked at the usefulness of e-book readers in education (e.g. Janssen & Martin, 2009). However, these studies investigated the value of e-book readers in relation to teaching and learning, and focused on students.

Academic staff will use e-book readers for different purposes, and will have other requirements, and this has received little attention in the literature. The aim of this study is to investigate the value of e-book readers to academic staff, with the following research question:

What is the usefulness of an e-book reader for an academic's day-to-day tasks?

This dissertation reports from an exploratory study, using a case study approach, whereby participants, academic staff of Kingston University, were given an e-book reader for a period of four weeks. During this period, the volunteers explored the

usefulness of e-book readers for their work, and their findings were captured with semi-structured interviews at the end of the trial. The study, i.e. the data collection and analysis, and reporting, was structured with the help of a theoretical framework activity theory (Engeström, 1987).

In the first chapter of this dissertation, a case for the study is made with a literature review and the formulation of the main research questions. The second chapter will introduce and discuss the theoretical framework activity theory that is used to structure this investigation, together with the formulation of subsidiary research questions and the analyses of the results. The research approach, methods and design, and how the data was analysed, will be discussed in the third chapter. The results are presented and discussed thematically in conjunction with the literature in the fourth chapter. The final chapter will draw conclusions, summarise the findings, and discuss the limitations of the results in relation to the transferability, the theoretical framework and wider themes. A combined glossary and list of abbreviations of unfamiliar terminology are given in the appendix 8.2.

## 2. Literature review

This chapter will make a case for this research project by exploring some of the wider issues of ICT in Higher Education (HE), focusing more closely on the use of mobile technology, especially e-book readers and electronic text, and the formulation of the research question.

Several authors have recently argued that Information and Communication Technologies (ICT) have changed ways of working in Higher Education (HE), especially with the digitalisation of resources. A Demos report by Bradwell (2009: 8) argues that ICT will, 'cause a change' in the routines of production, access to, and distribution of research, as well as teaching and learning practices in HE. Bradwell (2009) is not alone in this view. Katz (2008a: xiii) argues that the internet has changed practices in teaching and learning and extended its presence online. It has also changed research, as "unprecedented access to scholarly information" has become available. Katz (2008b) argues that technologies will increasingly mediate access to libraries, laboratories, buildings, research and people. Furthermore, it will increasingly mediate the way information is (re)produced, stored and distributed, and will have a lasting influence on practice in research, teaching and learning (Katz & Gandel, 2008). Ipsos MORI (2008) confirms that contemporary students are more likely to use digital resources, university technologies as well as personal devices for their learning, and have increasing expectations from universities to facilitate the use of ICT for teaching and learning.

Some caution is needed concerning the 'caused a change' description, given to technology by Bradwell (2009) and Katz (2008b). As Selwyn (2011) argues, technology determinism often accompanies debates in educational technology, and

instead of causing a change, educational technology can also be seen as vehicle to transform education for e.g. social, political and economical reasons.

Moreover, it could be argued that Bradwell (2009) and Katz (2008b) argument is a historical perspective. According to Smith (2005), early developments of ICT in HE date back to the mid-1960s. Computers were used then for research, teaching and learning, and, during the 1990s, they were made use of more as technologies became more reliable and software lowered 'entry barriers' for academic staff (Smith, 2005: 105). In particular, after the invention of the internet browser in the early 1990s, digital technologies were utilised more by "non-technical academic users" (Smith, 2005: 101). Common examples in an academic context are desktop computers, office software, the internet, digital library resources and Virtual Learning Environments (VLE).

The early digitalisation of academic text can be traced back to the 1970s, with the foundation of the Online Computer Library Centre (NetLibray, 2009). Živković (2008) argues that it became common to distribute academic journals electronically, following the standardisation of the Portable Data Format (PDF) and the introduction of the internet. During the second half of the 1990s digital books and digital publications gained "more importance in the plans of publishers and in the holdings of libraries", and today almost all major academic publishers including Ebrary, Elsevier ScienceDirect, Oxford Journals and Blackwell Publishing distribute their journals online (Ebrary, 2009; NetLibray, 2009; RIN, 2011; Živković, 2008: 3). These resources are used extensively by academic staff and students alike, according to a report by the Research Information Network (RIN, 2009). However, as Levine-Clark



(2006) shows, the use of these digital resources varies widely between individuals and academic disciplines.

According to Bradwell (2009: 43), online resources such as e-journals are just one of the “many examples of the digitisation of resources and research data” and ICT has a much wider implication for HE. Although these changes will be largely beneficial for HE, Beetham et al. (2009: 3) argue that the changes in practices will also have social consequences, and are wary that technologies will, for students and staff alike, “erode the boundaries between work, leisure and learning, between home, school and workplace”. Ipsos MORI (2008) and Beetham et al. (2009) expect this to intensify, as learning migrates to a more ICT-based practice, with an increasing use of mobile, and/or ubiquitous and embedded technologies. This suggests that digital text on mobile devices could make research, teaching and learning more flexible. However, before we can investigate this possibility, a closer examination of mobile technologies in HE is required.

## **2.1. Mobile technology and its use in education**

Mobile technologies such as mobile phones, smartphones, laptops and media players are portable, small and relatively lightweight. These devices “can be carried around with relative ease and used for communication and collaboration”. They can also be used for teaching and learning in various locations, “whatever opportunity arises” (Kukulka-Hulme, 2005a: 1). According to Traxler (2005a; 2007) and Sharples (2006), over the last 10 years, the use of mobile technology in teaching and learning has received increased attention and is gaining considerable significance, as can be seen by the growing number of dedicated conferences, seminars, workshops and academic papers relating to this topic.

There have been numerous case studies published on mobile learning, for all kind of purposes and involving different technologies. The majority of case studies involve a Personal Digital Assistant (PDA) or smart phone. These multi-purpose devices seem to be very versatile for an educational setting (Traxler, 2005b). Collections of case studies involving PDAs include Kukulska-Hulme & Traxler's (2005) book on mobile technology, van 't Hooft & Vahey's (2007) special issue in the journal Educational Technology, The Stella report (Brown Eds, 2009) and Ally's (2010) book on mobile technology. Case studies on mobile learning also feature other technologies, for example Global Positioning Systems (GPS), digital cameras, tablet PCs, portable music or MP4 players and portable DVD players, mostly employed during field trips or in other situated learning contexts (Brown Eds, 2009; Hawkes & Hategekimana, 2010; Jarvis & Dickie, 2010; Pfeiffer et al., 2009).

Mobile devices have many advantages. Kukulska-Hulme (2005a: 2) suggest that they are "spontaneous, personal, informal, contextual, portable, ubiquitous (available everywhere) and pervasive (so integrated with daily activities that it is hardly noticed)". These advantages are not limited to teaching and learning, although it seems that most research has been done in the teaching and learning context. As Clough et al. (2007) show, in business, smartphones and PDA's are used to mediate work and informal learning, because they can be used to write down ideas, make lists, take (audio) notes, issue reminders and annotate downloaded materials. Pre-loaded e-books, papers and web pages can be read on the move. Furthermore, the majority of the participants in Clough et al.'s study (2007) synchronised their calendar and contacts on a daily basis, which is known as "personal information management" (PIM) (Kukulska-Hulme & Traxler, 2005: 36). The devices were regarded as useful as

information could be read anywhere, anytime and timely information could be delivered regarding any event (Clough et al., 2007: 108). The ability to deliver timely information to employees, on small and portable devices that can be accessed when needed, is a force behind staff development in larger companies such as IBM (von Koshembahr & Sagrott, 2005). Smartphone users with devices like Blackberries and iPhones were already using them to read and write e-mail, access online information and keep a digital diary on the move, or on times otherwise not used productively. As such, academics could use mobile devices to engage with text and email, and access their diary at places and times that they couldn't previously, and this could help "improve the[ir] productivity and efficiency" (Kukulska-Hulme & Traxler, 2007: 182).

## **2.2. Electronic books and e-book readers**

One example of a mobile device that is becoming more widely used is the e-book reader. The device is small and light enough to carry around, and it displays electronic text. This could be an advantage for academics, as many texts are digital available. It allows academics to engage with text in places and at times, they normally would not have been able to, thereby optimising their time and productivity.

E-book readers are paper book simulators. Contemporary e-book readers use electronic ink display technology, known as E-ink, which was invented in 2004 by the Massachusetts Institute of Technology Media Laboratory (Siegel, 2009; Young, 2006). E-ink screens display electronic text in such a way that it closely resembles printed text, giving them an advantage over other display technologies such as computer screens (Siegel, 2009: 9). An e-book reader is able to store large quantities

of digital text and contains functionalities to support reading. A detailed description is given in appendix 8.3.

E-book readers as a display technology share much of their development with that of electronic text. This will be discussed in more detail next.

### **2.2.a. Electronic text**

Electronic text is not printed, but is distributed in electronic formats which can be read on different displays. This has its origin in the 1970s (Živković, 2008). Important milestones in the development of electronic text are: Michael Hart's project Gutenberg in 1974, which made books digitally available in the public domain, and the development of the internet, as this enhanced distribution after 1995 (Lebert, 2008, Živković, 2008). Today, Project Gutenberg offers 33,000 free ebooks "to read on your PC, iPad, Kindle, [...] or other portable device" (Project Gutenberg, 2011). On an academic level, NetLibrary, created in 2009, offers over 200,000 electronic book titles, and Ebrary has almost 43,000 books, handbooks, manuals and reports which are digitally available (Ebrary, 2009; NetLibrary, 2009; NetLibrary, 2011). A similar picture arises with all major publishers of academic journals. A study by RIN (2009) concludes that nearly all journals that are digitally available are used. The internet provides a convenient way to access online journals, with aggregators such as Google, Google Scholar, Web of Knowledge and PubMed (RIN, 2011: 9). Finally, Google Books has digitalised millions of books since 2004; in 2009 it reached over 10 million. Depending on Copyright restrictions, sections of the books can be viewed and searched with the help of Google scholar, and books in the public domain can be downloaded as PDF files, adding to the available academic sources (Brin, 2009).

The abundance of digital text is not without its limitations. Ebrary (2007) concluded, based on a worldwide survey, that electronic books still form only a small part of libraries' collections. Almost half of the responding libraries had access to more than 10,000 electronic books; however, these were poorly used in comparison with paper books (Ebrary, 2007). Furthermore, a 2006 JISC funded study, which investigated the feasibility of electronic books for HE libraries, concluded that there were limitations on 'borrowing' models and access caused by digital rights management (DRM). JISC also found that electronic books were expensive, problematic reading platforms, with formats that constrained their use (Chems, 2006). Nevertheless, as RIN (2011: 24-5) shows, that digitally available academic articles are extensively used, especially by academic staff and research students.

### **2.2.b. E-book readers**

Horizon Reports, published annually since 2005 by The New Media Consortium and EDUCAUSE, describe areas of emerging technology. In 2010, the Horizon Report (2010:17) reported that it expected the e-book reader to have a "significant impact on Higher education", and put the e-book reader on the "time-to-adopt horizon" for 2 to 3 years. Horizon Report (2010: 17), described the usefulness of the e-book reader as convenient, and capable "of carrying an entire library in a purse, pocket, or book bag", with the appeal of reading wherever you "find time for a few pages in between appointments or while commuting". In 2011, the Horizon Report (2011: 8) concluded; that "electronic books are a viable and easy alternative to printed ones", as a variety of devices, some single-purpose like e-book readers, others multi-purpose like tablets, make the "availability of both reading devices and digital content [...] very easy to integrate electronic books into everyday portable computing". The claims in the reports seem to be related to sales in the consumer market, as the Horizon

Report in 2010 refers strongly to the Amazon Kindle, and the 2011 report to the iPad tablet.

The appeal of reading from portable devices was seen as early 2002 by Marshall & Ruotolo (2002: 13), who investigated reading from small devices. Their motivation was the:

“widespread availability of digital library materials and users’ increasingly willingness to read on the screen, [which] raised the question of whether people can and will read digital library materials on handhelds”.

However, reading from small digital devices dates back to the early 1990’s, when multi-purpose devices such as the Pocket PC allowed reading of electronic text. Although initially they delivered a poor reading experience, during the mid 1990’s more specialised devices with better screen resolution and memory became available (Herther, 2008). As Marshall & Ruotolo (2002: 16) found, these devices were regarded as good for “quick reading, skimming and scanning, to meet the needs of a highly time-constrained, highly-fragmented day”. However, their use was restricted by constraining factors such as no annotation, and they also had limited possibility to search and navigate. Wilson (2003) found that dedicated e-book readers and pocket PCs were attractive, due to being portable and having additional PIM functionalities such as diaries and notebooks. Corlett et al. (2005) reported similar findings with students, but only a few had used the devices for reading course materials. Nevertheless, the devices were difficult to use, lacked reading functionalities such as annotation, and were also expensive and “prone to damage, loss or dead batteries” (Wilson, 2003: 14).

Reading experiences from screen improved when ‘electronic ink’ or E-ink was invented in 2004 (Siegel, 2009: 8; Young, 2006). According to Siegel (2009: 9), E-ink

displays have many advantages over normal displays, as E-ink is a “display technology designed to mimic the appearance of ordinary ink on paper”, and also the new devices have improved battery longevity. E-ink made the devices lighter, more pleasing on the eye and portable; and from 2006 onwards, E-ink was adopted by most companies producing e-book readers, e.g. Amazon, Sony and Samsung (Siegel, 2009: 8). Some recent e-book readers seem to have overcome some of the initial limitations, by offering note-taking, highlighting and ‘dog ear’ or bookmarking functionalities. Furthermore, some of the devices are equipped with other innovations which enhance the reading experience, such as inbuilt dictionaries, text to speech and wireless connections to the internet (Amazon, 2010; Samsung, 2010; Sony, 2010). A more in-depth description of the e-book reader is available in appendix 8.3.

### **2.2.c. E-book readers in teaching and learning**

As e-book readers have been developed and promoted for leisure, and not for the educational sector, “any educational use is likely to involve adaptation, appropriation and compromise[s]”, as Traxler (2005a: 73) argues. The grey literature, from non-conventional sources such as websites, reviews, newsletters, technical reports and working papers, discusses the educational potential of e-book readers (e.g. Gorard & Taylor, 2004: 47; Grinnelly & Unrau, 2008: 272). Other benefits include the storage space, which allows teachers and students to store and organise all their learning materials, textbooks, documents and research papers in one location (Gustafsson, 2009b). Going digital, environmental benefits, reducing the cost and weight of learning materials are also often mentioned (BBC, 2008; BBC, 2011; Gustafsson, 2009a; Moore, 2010; Peters, 2009). Lastly, every student will benefit from additional functionality such as text-to-speech, a dictionary, and access to multiple texts at the

same time. This will, according to Gustafsson (2009b) and Stahmer (2009), stimulate multi-tasking and make studying more productive and engaging.

Reviews of e-book readers are not exclusively positive in the grey literature. The single-purpose approach of e-book readers is often criticized. No access to the internet means that reading sources are limited, and that it is not possible to connect with others over IM, e-mail or discussion boards. Furthermore, current e-book readers do not support multimedia such as films, quizzes and simulations. This would seem to limit their usefulness, compared with multi-purpose devices such as laptops, netbooks, and especially tablets (Bilton, 2010; Ganapati, 2009; Lardinois, 2009; Stahmer, 2009).

Some caution needs to be taken regarding the claims in the grey literature. As Enroth (2009) and Ritch (2009) show, the environmental gains of using digital educational resources on the Amazon Kindle are arguable. There are further concerns regarding commercial motivations, as companies such as Amazon and educational publishers will benefit financially from positive branding of e-book readers (e.g. BBC Newsnight, 2009; BBC, 2011).

Academic literature which is available on e-book readers is orientated towards teaching and learning. As stated in the grey literature, environmental gains were an important driver behind the Northwest Missouri State University's decision to deliver e-text on Sony PRS-505 e-book readers. Although students saw the potential of this device, they became "frustrated with the devices' limited interactivity capabilities", which made it impossible to highlight and manipulate text as they were used to doing with printed text (Shieh, 2009). Kolowich (2010), describes preliminary results from



three HE studies in the US, where students were given an Amazon Kindle DX for their coursework. Although this e-book reader has a range of functionalities, its usefulness was not without problems. “The inability to easily highlight text was the biggest lowlight”, and both navigation, and making annotations were impossible (Kolowich, 2010). Furthermore, some functionality only worked with specific formats, and as academic articles are published in PDF, it was seen as a considerable limitation that highlighting and making annotations with the Kindle DX was not possible on PDF documents. Moreover, academic scholarship often requires reading several documents simultaneously, which was difficult as this reader is “unable to have multiple texts open at the same time” (Kolowich, 2010). Most students also missed being able to use functions like flipping through a book, which limited the possibility of skim reading.

One of the greatest benefits of an e-book reader is the potential to carry a large quantity of electronic texts. Janssen & Martin (2009) explored this functionality by delivering course text on e-book readers to students of the Open University in the Netherlands. The opportunity to read course materials while commuting was well received, although interestingly, most of the students’ read at home, as this was a more convenient place to study. The e-book readers were useful, as they were small, light and had good battery life. However, the learning experience was constrained, due to reasons similar to those identified earlier. The Hanlin reader used in this study lacked functionality to engage with text, such as note-taking and underlining. Furthermore, Janssen & Martin (2009) note that it was necessary to convert the course materials into a more readable format, as using PDF files resulted in a poor display. This process was time consuming. Nie et al. (2011: 19) report similar findings with their distance students, who appreciated the flexibility of using e-book readers,

but found that course materials had to be 'pre-loaded' onto their Sony PRS-500s in the right format, in order that they were accessible.

Larson (2010) explored how note-taking, highlighting annotation, searching for keywords and using text-to-speech on an Amazon Kindle helped schoolchildren to develop their literacy skills and engage with text. According to Larson (2010: 17), the Amazon Kindle stimulated and extended the reading experience, as the "connection between readers and text as engagement with and manipulation of text was made possible through electronic tools and features". However, the results of this case study might not be applicable to other situations, as the two primary school children who took part in the study would clearly have gained something from the additional functionality, as English was their second language. Nevertheless, Larson (2010) points to another useful aspect of the e-book reader: unlike paper books, all e-book readers have the ability to adjust the font size, thereby making text more accessible, especially for the visually impaired, or persons with learning difficulties.

Like Larson (2010), Wines & Bianchi (2010) used an Amazon Kindle in an HE course on English writing, to stimulate students' engagement with text and essay writing skills. According to the students, quick access to the inbuilt dictionary and text-to-speech expanded their vocabulary considerably compared to previous semesters. Furthermore, according to the students the ability to take notes, annotate and save text contributed "to a deeper engagement with the readings than they had experienced in the past" (Wines & Bianchi, 2010). This was partly caused by a 'closed' and 'isolated page' experience, as some reported, which forced them to focus on an individual paragraph as the surrounding text was not displayed (Wines & Bianchi, 2010). The ability to take notes also increased their summary skills, and the

“portable learning environment” expanded their vocabulary and reportedly led to better and more engaging essays (Wines & Bianchi, 2010). However, as the aim of the introductory English course was to extend their vocabulary, reading and writing skills, the outcome might not be transferable to other students, subjects or disciplines, where a different engagement with text is required.

It needs to be seen how e-book readers can fit into existing practices of academic reading, especially as Ugletveit et al. (2009), report that appreciation and use of paper books might not easily translate to e-book readers. Although Ugletveit et al. (2009) do not make this distinction, the findings might be separated into an affectionate bond with, and a practical preference for, paper books. Ugletveit et al. (2009: 10) report that children have an affectionate attachment to paper books, e.g. the smell of a new book can “give the sense that something exciting and new can happen”. Choice and preference for a book were based on subjective elements, unrelated to the content, such as cover, image and recommendation by others, which were not easily mimicked digitally. Secondly, a book was seen as very practical, e.g. the weight of the book, the “grip and visual sight” gave cues for the “reading process” (Ugletveit et al., 2009: 12). Compared to digital readers, it was easier in paper books to flip back and forward, and also search and jump to a specific part. Children mentioned the usefulness of adding post-it notes to the pages, which provided additional navigation, and could work as reminders. Even used books from the library, or ex-libris books provided some useful information left by others, such as underlining and notes. Although some of the findings seem to be specifically related to children, adults will share some of the affectionate bond with the book as an object, and the value of the practicalities mentioned by Ugletveit et al. (2009) has been confirmed (e.g. Kolowich, 2010). These non-technical aspects might interfere

with the usefulness of the e-book reader and need some further investigation, but as Ugletveit et al. (2009) argue, the advantages of using an e-book reader, such as reduced weight, might overcome these.

It is interesting to note that the lack of interactivity and connectivity with others e.g. IM or e-mail, which was one of the main criticisms in the grey literature, is not mentioned or discussed as a limitation in the academic literature. Communication with others while reading and studying might be less important than the grey literature suggests (e.g. Ganapati, 2009).

### **2.3. Conclusion and research question**

To summarise, digital academic texts such as journal articles are increasingly becoming available in digital format, as is other text related to academic work, such as students' assignments, memos, minutes and committee papers. Mobile devices have been proven to be flexible and portable and of additional value to support professionals in their work. Contemporary e-book readers seem to have overcome some of their initial limitations and now seem useful for teaching and learning. As e-book readers are able to store large quantities of digital text that can be read at anytime and anywhere, this seems to be an advantage for keeping u with work. Furthermore, as e-book readers allow notes and scribbles, student assignments can be stored, read, annotated and marked away from the desk. The e-book reader is, in short, a potentially supportive aid for different aspects of academics' work, giving them the flexibility to work, wherever and whenever they want.

However, studies are not yet available to support this proposition. Moreover, it is unclear whether e-book readers can accommodate the routines, habits and

conventions that surround working with academic text. If so, as Traxler (2005a) argues, adaptations will have to be made, as the e-book reader, as a mobile device, is designed for leisure and not for use in an academic context. This leads to the following research question:

What is the usefulness of an e-book reader for an academic's day-to-day tasks?

Academic work in this context must not be seen too broadly, but as being related to reading tasks. To answer the research question, the following notions based on the literature review are considered useful:

- the specific academic context and purpose of use,
- the existing habits, conventions or practices of dealing with academic text, and how these might change with the use of an e-book reader,
- the location of use and the benefits of using it in that location.

A framework that can host these notions would be useful to structure the research question and the data collection. Such a framework was found in activity theory, which will be described in the next chapter.

### **3. Theoretical framework: activity theory**

This chapter will start with a brief discussion of the different frameworks available to evaluate mobile technology in an educational setting; I will describe the theoretical framework activity theory, used for this study, and finish with the formulation of the subsidiary research questions.

Within the body of literature on mobile technology for education, different models and frameworks have been proposed to evaluate mobile technology (Sharples, 2006; Traxler, 2005b). Several of these models have been reviewed and considered to structure this investigation further and will be briefly discussed in this chapter. A more in-depth discussion can be found in the appendix 8.4. The framework regarded as being useful to structure the research question, the research approach and to analyse the data of this study, was found in Wali et al.'s (2008) adaptation of Engeström's (1987) Expansive Activity Model, and will be discussed in the following section.

Naismith et al. (2004), Kukulska-Hulme & Traxler (2007) and Frohberg (2008) all proposed frameworks to categorise individual mobile technologies and/or their uses. However, in all cases, the different categories cannot be clearly distinguished from each other. Naismith et al. (2004) differentiate educational technologies in relation to each other, Kukulska-Hulme & Traxler (2007) map the different uses of mobile devices, and Frohberg (2008) positions the different contexts and pedagogy in which they can be used. However, none of these provide guidance for further research into an individual technology.

Patten et al. (2006) proposed a framework to investigate the functionalities of mobile technology in relation to pedagogical use. Interesting as this seems, it is

strongly based on the functionalities of a PDA and smartphone, and cannot be transferred to other technologies with different functionalities. Furthermore, as mobile technology continues to develop, a functionality-based framework seems temporary, and moreover, the framework pays no attention to the context in which the technologies can be used.

Nevertheless, all these models consider notions that are useful for further research, such as the (social) context (Frohberg, 2008; Kukulska-Hulme & Traxler, 2007; Naismith et al., 2004), location (Frohberg, 2008; Kukulska-Hulme & Traxler, 2007) and application and functionality (Kukulska-Hulme & Traxler, 2007; Patten et al., 2006).

None of these models and frameworks attends to human-device-interaction (HDI). As Kukulska-Hulme (2005b) points out, based on the HDI literature, it is important to investigate experienced usability beside the technical aspects, because “usable systems and devices are generally regarded as being easy to learn, effective to use, efficient and enjoyable from a user’s perspective” (Kukulska-Hulme, 2005b: 43). Even taking into account that usability might be regarded as subjective, and influenced by age, education, cultural background, gender, etc., she puts more emphasis on the user than on the device usability. Kukulska-Hulme (2005b) also argues that technical usability alone, as investigated by Frohberg (2008), Naismith et al. (2004) and Patten et al. (2006), might be insufficient, because it is mainly concerned with software, hardware and issues such as the accessibility, reliability and compatibility. It is necessary instead to investigate the usability in its specific context of use; in the case of this study the academic context, as this could place extra demands on devices that are not met by the existing technology. Therefore, a

framework for further investigation needs to take in account the HDI usability in the academic context, a requirement met by none of the frameworks reviewed above.

A framework that brings together the social and educational context, location and technical aspects in analysing the use of mobile technology was found in an adaptation of activity theory, which will be discussed in more detail in the next section.

### **3.1. Activity theory as a framework for analysing mobile learning**

Activity theory, as developed by Engeström, is a conceptual tool to enable an understanding of the different concepts that influence human activity. According to Engeström, it is an:

Object-orientated, collective, and culturally mediated human activity, or activity system.

Minimum elements of this system include the object, subject, mediating artefacts (signs and tools), rules, community, and division of labour. (Engeström, cited in Kaptelinin & Nardi, 2006: 99)

Kaptelinin & Nardi (2006: 99) consider Engeström's activity theory model as a useful framework "for the evaluation of technologies and their use".

The activity theory, confusingly, is not a theory, but should be regarded as a framework or model to understand human activities. It has several developments and has different applications (Engeström, 1999; Kaptelinin & Nardi, 1997; Wali et al., 2008). Engeström (1987) distinguished three generations in the development of activity theory. It draws on earlier work by Vygotsky, one of the founding fathers of social constructivist learning theory, and others who developed the idea of mediation of activities (Mayes & de Freitas, 2007). According to Engeström (1987), Vygotsky defined activities as taking place between the subject, object and the mediating



artefacts (the tools used to make the activity possible). This model is positioned around the individual and does not include a social context. The second generation of activity theorists included a social layer in the model, and added the interrelationship between the individual subject and the community (Engeström, 1987). Engeström regards himself as part of the third generation of activity theory developers. He extended the activity theory to a framework of expansive learning that takes place “in the world of work, technology, and organisations”. And he broadened the utilization of the activity framework by adding a social layer, consisting of rules, community and divisions of labour to the model. This way, Engeström (1987) defined the structure by which human activity takes place.

To evaluate activities, Engeström’s (1987) Expansive Activity Model (see Fig. 1) made the subject, seen as the learner or employee, one part of the system. The object refers to the activity outcome, towards which the activity is directed (Sharples et al., 2007: 11). Tools or instruments are the mediating artefacts that accomplish the activities, seen as “both physical, such as technology, and conceptual tools such as language” (Wali et al., 2008: 45). Lastly, the social context that mediates the activity is defined by:

- a. the community, seen as a network of all individuals who share the same general object.
- b. the rules, which represent the “explicit and implicit regulations, norms, and conventions” that constrain or direct the interactions within the system (Sharples et al., 2007: 11).
- c. the division of labour, seen as “forced co-ordination” of tasks and organisation of work between the members of the community (Kaptelinin & Nardi, 2006: 101).

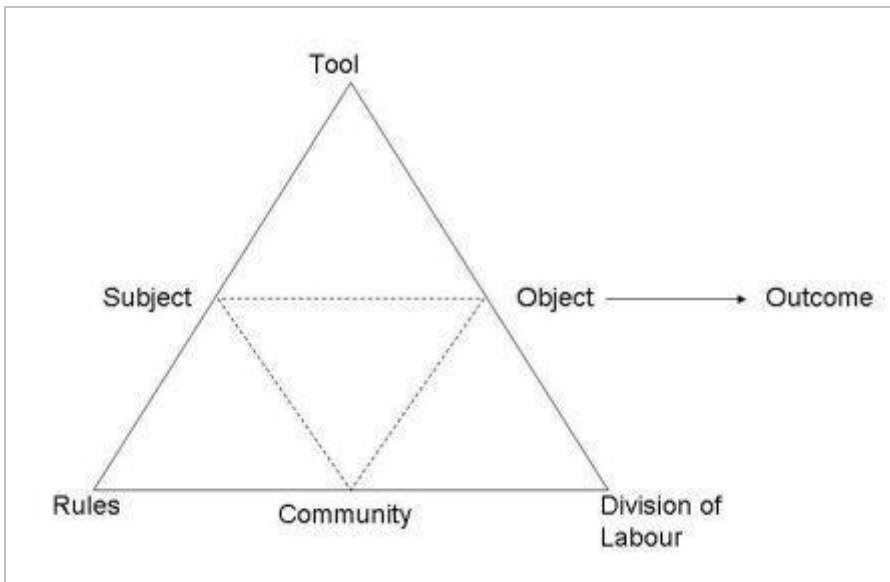


Fig. 1 Structure of human activity model based on Engeström (1987)

Engeström's (1987) Expansive Activity Model contains most of the different notions that have been identified as important for a framework for further evaluation.

However, Engeström's (1987) model does not include one important concept, namely location. While this may not normally be important to investigate e.g. conventional learning activities or organisational activities, as they take place in a fixed location, mobile devices allow the activity to take place in different physical situations, which might be influential on the activity. Sharples et al. (2007) apply the Expansive Activity Model to the context of mobile learning and put emphasis on technology and semiotic aspects. Although 'tools' in Engeström's (1987) model include all mediating artefacts that make activities possible, Sharples et al. (2007: 11) distinguish mobile learning activities from other activities by emphasising the technology, and add an additional technology layer that "shows learning as an engagement with technology". Accordingly, Sharples et al. (2007) add a semiotic layer to emphasise this aspect. This results in a reformulation of Engeström's (1987) model, and is called 'Framework for analysing mobile learning' (see Fig. 2). The concept of location,

absent in Engeström's (1987) model, is, although not explicitly emphasised, put by Sharples et al. (2007) under Context, or Community in Engeström's (1987) model.

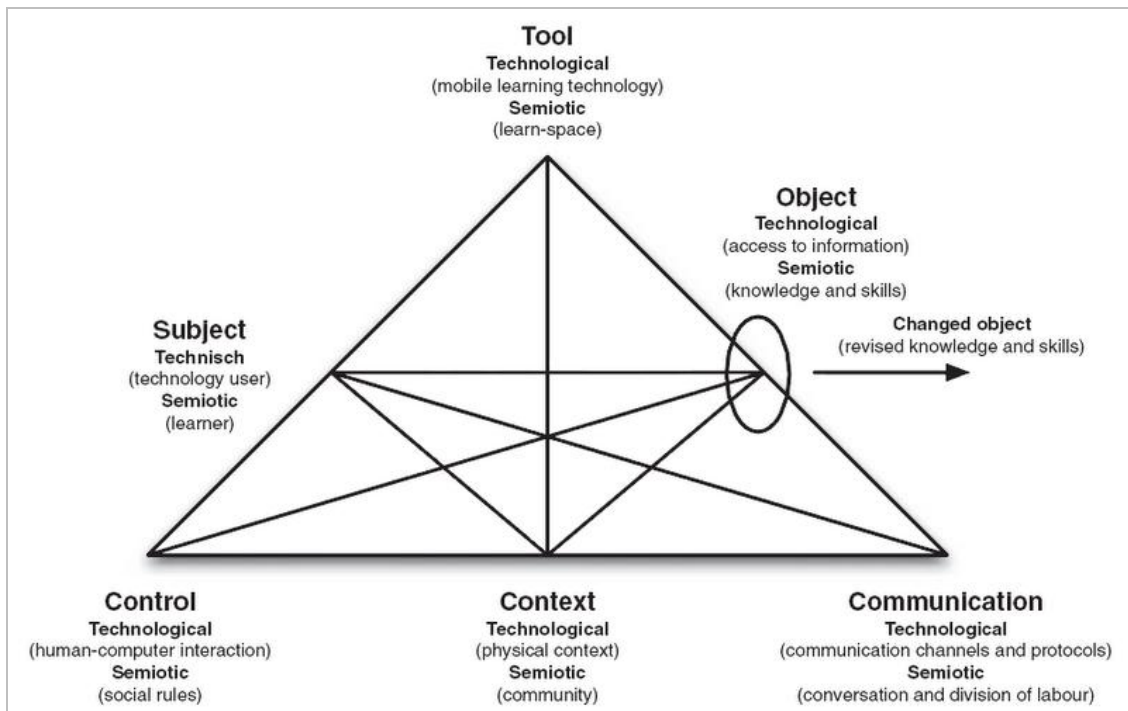


Fig. 2 Sharples, et al., 2007, Framework for analysing mobile learning (Frohberg et al., 2009: 310)

Wali et al. (2008) are concerned with Sharples' et al.'s (2007) emphasis on technology. Wali et al. (2008: 50) consider that technology is important. However, as learning has always used technology, defining mobile learning should account for "conventional device[s] as well as other technology". In the context of this project, it might seem useful to emphasise the role of technology as Sharples et al. (2007) do, as the main object of this investigation is the use of a specific technology. However, because e-book readers are similar to older conventional technologies, a broader interpretation of technology like Wali et al.'s (2008) is more appropriate.

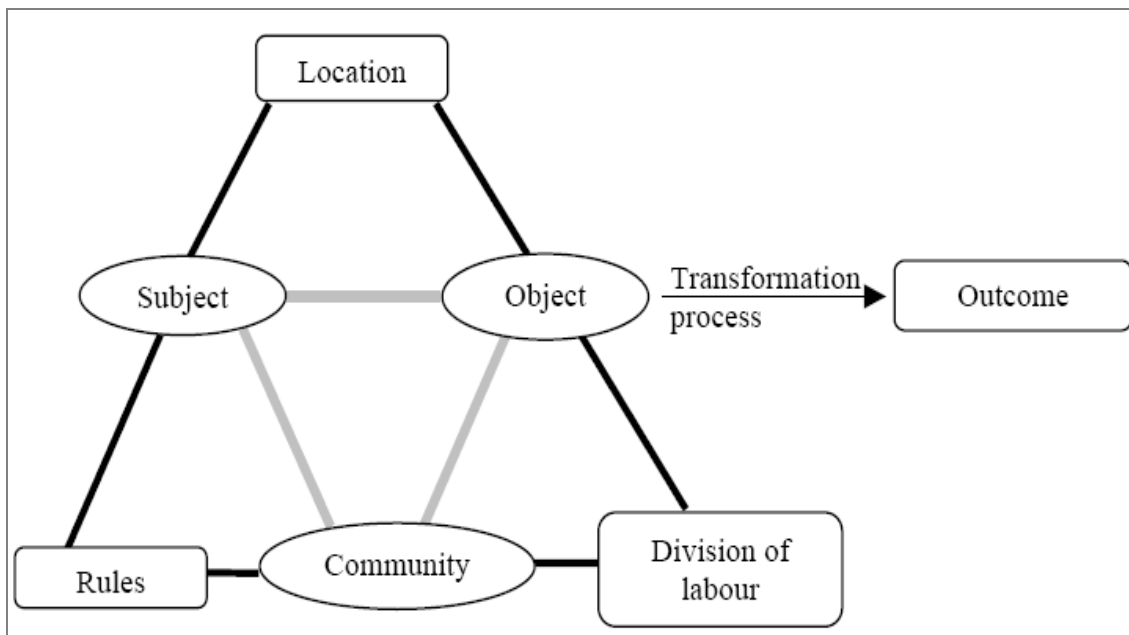


Fig. 3 Wali et al. (2008: 55), framework for analysing mobile learning

Wali et al.'s. (2008) adaptation of Engeström's (1987) model is much closer to the original Expansive Activity Model, and regards the location in which the learning activity takes place as part of the tool concept. Wali et al. (2008) propose removing the technology and semiotic layer added by Sharples et al. (2007) (see Fig. 3), as the attention to technology is already part of the concept of tools, and is embedded in Engeström's (1987) model. An additional layer of technology, as put in by Sharples' et al. (2007), seems to be a duplication, and complicates the practical utilisation of this model for evaluation, making Wali et al.'s. (2008) model more applicable.

Furthermore, according to Wali et al. (2008: 56), mobile learning should not focus on the use of mobile technology alone, but should put more emphasis on learning practices with any technology. As this project is not primarily interested in teaching and learning, in practice, the use of Wali et al.'s (2008) model seems more appropriate than the more narrow focus of Sharples et al. (2007). Lastly, Wali et al. (2008) give more explicit attention to the concept of location than Sharples et al. (2007), which, as argued above, is an important notion for this project. As such, Wali et al.'s (2008) model will be used to structure this investigation further.

The missing concept in Engeström's (1987) model is the concept of location. Sharples et al. (2007), although not as explicit as Wali et al. (2008), recognise this as a gap in Engeström's (1987) model. Whereas Sharples et al. (2007) put the location in the social layer Wali et al. (2008) merge it with the concept of tools. It might be argued in the case of Wali et al. (2008), that the influence of the location is not limited to the concept of community as in Sharples et al.'s (2007) model, and that the location in a mobile context has wider implications for the activities. However, it could also be argued that the location does not mediate an activity in the same way as tools do, as Wali et al. (2008) reason. When the subject uses mobile technology for an activity, he is present in a location. A location might have a passive influence on the activity, such as reading an e-book reader while commuting, or a more active influence, such as using technology to obtain more information about your surroundings, as in on a field trip, or during a museum visit. In either case, the subject is situated by the location he/she is in, and this might change the object of the activity he/she is used to in that location. To summarise, the location situates the subjects within the activity theory, and as such, the concept of location needs to be seen as part of the concept subject in Engeström's (1987) model (see Fig. 4).

This proposition has several implications that cannot be discussed here, of which the most important is that the subject or individual changes according to the location he/she is in, e.g. at work, at school, on holiday and playing sports. Theoretical support for this will be found in Engeström's (1987) own work, as his examples indicated that e.g. learning activities are situated and can take place in different locations e.g. school and work. Although Wali et al.'s (2008) model will be used to structure this investigation further; it will be interesting to explore the location's

influence on the concept subject during this study, in order to gather evidence for the above proposition. The influence of the concept location will be explored for this purpose in this study.

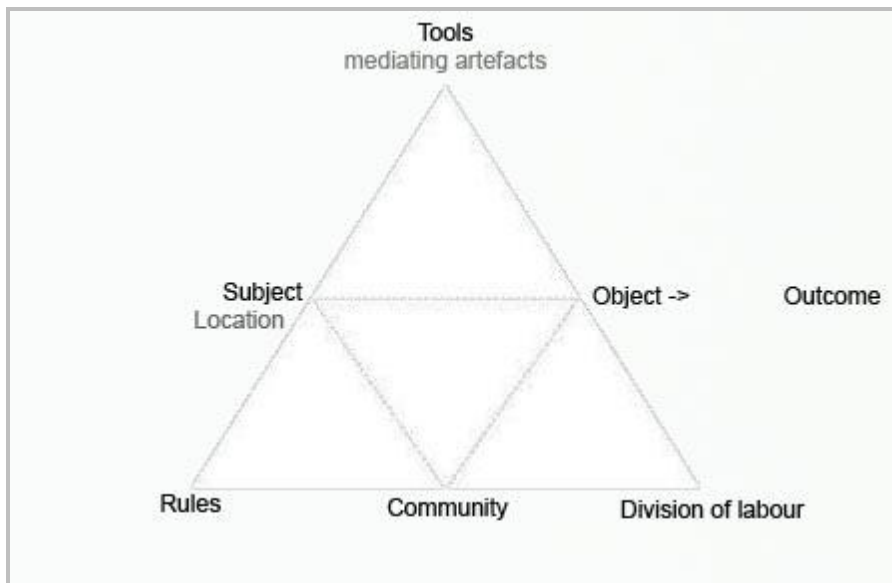


Fig. 4 Position of the concept Location in AT based on Engeström (1987)

### 3.2. Summary and subsidiary research questions

It is important to recall that activity theory is not a theory and must be seen as a framework (Engeström, 1999; Kaptelinin & Nardi, 1997). The framework is useful as a tool to structure the evaluation and to describe the data, but it could be seen as a limitation that activity theory does not explain the phenomenon investigated. For this reason it was decided to describe the data thematically in close relationship with the literature on e-book readers. The application of Engeström's (1987) Expansive Activity Model by Wali et al. (2008) results in notions that are useful to structure this exploratory study and can be summarised as (Table 1):

Table 1 Research notions

	Activity theory framework
a focus on the subject who is conducting the activity	Subject
an explicit object-orientation of the activity	Object
a notion of the human-device usability and technological mediation	Tools
a notion of the physical location in which the activity takes place	Tools
a notion of the (social) context in which the activity takes place	Rules, and/or community, division of labour,
a notion of the previous ways in which the object was achieved	Rules and/or division of labour

These research notions (Table 1) are used to formulate subsidiary research questions, which are questions that “contribute to answer the main research question” (Andrews, 2003: 26). To investigate the main research question (p. 20), the following subsidiary research questions are defined with the help of the research notion (Table 1):

Table 2 Subsidiary research questions

	Activity theory framework
For what purposes are e-book readers used in a HE context?	Object
What is the subject’s interaction with an e-book reader (HDI) in an academic context?	Subject and/or tools, rules
How did the different functionalities/applications of an e-book reader contribute to the different activities?	Tools
What existing practices or conventions do, or might an e-book reader substitute or supplement?	Rules and/or division of labour, community
Why, and in which physical contexts are e-book readers deployed?	Location

As the research question is refined with the help of these subsidiary research questions, by using the activity theory as a research framework, the next section will describe the research approach and research design, to explain how the data were collected and analysed, before the research question is answered.



## **4. Research approach**

Now that the research question has been developed with subsidiary questions, the research approach will be described in this chapter, starting with a description of the analytical framework used, followed by the research design, which will describe the research method, ethical considerations, and how the data was collected and analysed.

### **4.1. Analytical Framework**

According to Babbie (2007) and Durrheim (1999), social research is done for many different reasons, but usually studies are undertaken for three purposes; exploration, description and explanation. Exploratory studies usually begin with a curiosity to examine 'new interests', 'break new grounds', or 'yield new insight' (Babbie, 2007: 88-9). However, one of the disadvantages of exploratory studies is that they rarely "provide a satisfactory answer" (Babbie, 2007: 89). Descriptive studies are done to "describe situations and events"; the researcher reports carefully what, where and when things happen, as accurately as possible (Babbie, 2007: 89). However, in the end researchers have to explain things, which leads to the third reason for social research; an explanatory study tries to provide an answer to the question of why things happen (Babbie, 2007).

However arguably, all structuring is artificial, and almost all research will contain elements of all three aims; research studies will always contain elements of curiosity to explore topics in more detail, they will describe the topic and will also provide some kind of explanation.

Literature is available on the use of e-book readers within teaching and learning, but less is documented about its usefulness for the day-to-day practices of academics. Furthermore, e-book readers are far from being a saturated technology in HE, which limits the opportunity for a study with descriptive objectives and a conventional research design, such as a cross-sectional quantitative study as Bryman (2001) suggests. For this reason, an inductive approach towards theory whereby generalisations are made based on the observations, makes an exploratory research objective and the use of qualitative research methods more appropriate, as they are most often used to provide “‘thick’ descriptions of phenomena” (Durrheim, 1999: 48). It was decided to investigate academic staff using an e-book reader in their professional context, by, as Bryman (2001: 52) puts it, a “detailed and intensive analysis of a single case”.

Because this study used a qualitative research method, quantitative evaluation criteria, such as reliability, replication and validity were inappropriate. Alternative criteria based on trustworthiness, are, according to Bryman (2001: 377), more appropriate for a qualitative study, and have been adopted as evaluation criteria instead.

#### **4.2. Research design**

This section will describe how the data was collected and analysed, starting with a description of the study, the research methods, participants, ethical considerations and the methods of data analysis.

In this case study, academic staff were recruited on a voluntarily basis and were asked to trial an e-book reader for a period of 4-5 weeks, to explore the usefulness of

it for their academic work. No restrictions were put in place in order to keep the exploration authentic and the threshold of participating low. The only direction set was that usage had to be work related, although connections between work and leisure were not excluded.

To ensure the results would be relevant to other e-book readers outside of this study, contemporary readers from different companies were used with the same functionality, to avoid that the results are only applicable to one device.

The case study approach in itself limits the transferability of the results, as the sample size was relatively small, and was taken locally at one university. However, by using an appropriate framework to structure the research design and analysis of the data, credibility was increased to make a 'representative case' (Bryman, 2001: 56). This framework was found in activity theory as discussed in the previous chapter. The next subsections will describe the considerations that informed the research methods, participants and data analyses, and ethical clearance.

#### **4.2.a. Research method: semi-structured interview**

Participants' experiences after trialling the e-book readers were captured in semi-structured interviews, in order "to understand themes of the lived everyday world from the subjects' own perspective" (Kvale & Brinkmann, 2009: 27). A semi-structured interview is a qualitative research method that is neither an "everyday conversation nor a closed questionnaire" but provides a "focus on certain themes" (Kvale & Brinkmann, 2009: 27). The focus on experiences will contribute to the transferability of the results, as although recruited locally, academics have more or less similar tasks, and their experiences will be recognisable by others in similar positions.

Furthermore, it was decided to continue the data collection until the subsidiary research questions were sufficiently saturated (Bryman, 2001). The focus for the interview guide was found in the subsidiary research questions, which were derived from an established theoretical framework. This way, the credibility of the findings was enhanced, despite exploring a relative new area. To create consistency throughout the different interviews, an interview guide was designed to enhance dependability (Bryman, 2001). A copy can be found in appendix 8.5.

Other methods of data collection were considered, e.g., observations being kept in structured diaries (Bryman, 2001). Although useful as a method to record different types of behaviour, keeping diaries is time consuming and “can suffer from a process of attrition” over time, making the data less reliable (Bryman, 2001: 228). In order to keep the threshold for participation low, an interview was considered to be less time intrusive for the participants.

#### **4.2.b. The participants**

Participants were recruited on a voluntarily basis at Kingston University. This is a post-1992 university with roots dating back to 1899 when it was a technical institute. The 25,000+ students follow courses in seven faculties, divided into three schools and spread over four different campuses in south west London (Kingston, 2011). A newsletter item was published in the Academic Development Centre quarterly newsletter (ADC, issue 13, November 2010) outlining the project; this included a call for volunteers. The ADC newsletter was distributed to the 700+ academic staff members. Participants could contact the researcher if they wished to participate. The text of the newsletter item is available in appendix 8.6.

In total 21 participants were recruited. However, for the duration of the project 6 participants had strong commitments elsewhere, and were unable to start using an e-book reader. After the first 10 participants had been interviewed and the interviews had been transcribed, it was decided that the subsidiary research questions were more than sufficiently saturated. The remaining 5 participants were still interviewed, but as no new results were found, the interviews were neither transcribed nor the findings included in this report. 7 of the participants included in the data analyses were lecturers with teaching duties, one was an academic developer, one was a researcher and one was a member of the management team. All participants were between 25-65 years old, with half of the participants being aged between 45-54. 4 out of 10 participants were female.

Almost all faculties of Kingston University were represented in the sample. 3 were recruited from the central department ADC, 2 from the faculty of Engineering, 2 from Sciences, 1 from the faculty of Law, 1 from Social Sciences and 1 from Education. The 5 additional participants excluded for reasons of saturation were all from the faculty of engineering. Including them would have skewed the data towards one context of use, decreasing the representation of the case (Bryman, 2001). The 3 participants from ADC were known to the researcher, as they worked in the same department. This could influence their experience. However, all 3 have their own specific employment, and do not work closely with the researcher. Moreover, care was taken with the help of the interview guide, not to bias the interviewees' experiences. The other 7 participants were unknown to the researcher.

As the project had only limited access to hardware, it was decided to divide the participants into three groups, so that hardware could be rotated and reused by each

group. Participants were offered the opportunity to trial an e-book reader for a period of 4-5 weeks, and stimulated to explore the usefulness of the device for their work. Four weeks is a short period, and it limits the possibilities for integrating the device in their daily activities. Furthermore, not having ownership of the device might have limited the willingness of the participants to invest money into using the device fully e.g. buying books from an online store etc, which, if the device had been their own, might have happened. This might have influenced the authenticity of the exploration. However, it was seen as sufficient time to explore the usefulness of the device for participants' specific tasks. During the study it became apparent, that 5 of the 10 participants owned their own e-book readers: these were bought or received as gifts, during, or shortly before participating, in the research. As this concerned half of the participants, the authenticity of their experiences became enhanced, as participants reported having personalised their own e-book readers with purged books, etc. Furthermore, when this became known to the researcher, care was taken to provide participants who owned e-book readers with different ones for the trial, to allow comparison and to broaden participants' experiences, increasing the transferability of the results. Furthermore, to focus participants' exploration, each participant was asked to write down the object of their exploration before the trial. Lastly, to make the most of the 4 weeks, all participants were given an introduction to the readers' functionalities, so they could start right away. As part of the introduction, the basic information described above was obtained from the participants using a small questionnaire, see appendix 8.7.

#### **4.2.c. Ethical considerations**

Bryman (2001) differentiates four main ethical principles in social research that need to be addressed: avoidance of harm to participants, informed consent, invasion of privacy and deception.

Although no immediate harm, stress or pain was expected during the study, participants were warned, as the e-book reader is an electric device, to take particular care with young children and animals. The study was not considered to be an invasion of privacy, because the focus was on a general aspect of the participants' work in conjunction with a specific device. The semi-structured interview did not contain any questions that referred to personal matters, which could have been considered to be an invasion of privacy, and participants had the right not to respond to questions if they felt they were intrusive. For the same reason, it was not seen to be necessary to use any form of deception during the interview to obtain information from the participants.

Data collected from the participants was stored in a password-protected environment, and access was limited to the researcher and supervisors of this study. Furthermore, care was taken not to include any information that could be traced to an individual, in the publication or report on this project.

Based on ethical guidelines and procedures for research with human subjects from Kingston University (Kingston, 2010), an information sheet was designed which explained the aim of the study, the way data were collected and stored, how the participants' privacy was protected, and what was expected from the participants if they decided to participate. Furthermore, the information sheet clearly stated that

participants were allowed to withdraw at anytime, and that the data obtained relating to them, could, if they wished, be removed and excluded from the report. The researcher informed every participant of this orally, and participants were asked to sign the informed consent form and were given a copy at the start of the project.

After ethical clearance was received from the Institute of Education, data collection started. A copy of the information sheet and consent form can be found in the appendices 8.8 and 8.9.

#### **4.2.d. Method of data analyses**

Interviews were recorded and completely transcribed. In order to analyse and report on the data, all the text from each individual transcript was divided, as far as possible, into complete sentences or segments. The transcript was put into a table, so that each segment formed an individual row, which was numbered. All names that could identify the interviewee were changed, and each participant was given a random code of three letters in order to distinguish them. This made it possible to refer to a specific segment of an individual transcript, making the data more accessible to peers, and enhancing dependability in case of an external 'audit' (Bryman, 2001: 378), see Table 3.

Kvale & Brinkmann (2009) differentiate different forms of analysing techniques to interpret transcripts e.g. linguistic, conversation and discourse analysis. None of these was seen as appropriate as they analyse specific aspects of a discourse, which is not the object of this study. However, these techniques start with coding, which "involves attaching one or more keywords to a text or segment in order to permit later identification", which was seen as a useful approach (Kvale & Brinkmann,



2009: 201-2). As this study built on a theoretical framework, the different concepts of the activity theory (Fig. 3) were used as the initial codes. These codes were supplemented with additional codes, found by labelling recurring themes in the data, and when similar themes were found in other transcripts, cross-references were made. See Table 3 as an example:

Table 3 Transcript example with numbering and coding

No.	Sentence or segment	Codes & reference
TCS 25	<b>OK, and figures are an important part of your work academic work?</b>	
TCS 26	A very important part. A lot of the research I do is based on more empirical data, so numbers basically, but even without that, a lot of qualitative data can be presented in sort of figure form, sort of ...	Rules, PDF, figures, see: GQP 24

In order to make interpretations and generate meaning from the transcripts, a mixed technique was used, described by Kvale & Brinkmann (2009: 233-4), called 'Bricolage'. This consists of clustering and grouping data into themes and then analysing these in conjunction with the literature. The subsidiary research questions were used as the themes (Table 3), which derived from the activity theory. The data, coded with the initial codes, was grouped together under the corresponding themes. As the initial codes were based on the activity theory they could be linked to the themes. This way, conceptual coherence was assured and analyses of the data could start. One complete coded transcript is available in appendix 8.10. The other coded transcripts are available on request.

#### 4.3. Pilot

To ensure confidence, and the adequateness of the research instruments, especially the interview guide, a pilot study was initially undertaken with three participants

(Bryman, 2001). Following the pilot study, some minor changes were made to the semi-structured interview questions. However, it was decided that because these changes were minor it would be appropriate to include the pilot data in the main study.

The in this chapter described approach to research was implemented, leading to the generation of data and its analysis. The results of this process will be described and discussed in the next chapter.

## **5. Description of the findings**

This chapter will describe and discuss the empirical data. It is structured mainly by the subsidiary research questions (Table 2), which will be used as sections. The findings will be described, analysed and thematically discussed, in conjunction with the literature under each research question. This will be followed by a summary at the end of each section.

In this project, three different types of e-book readers were used: the Amazon Kindle, the Sony PRS-600 and the Samsung E60. Although produced by different companies, they are quite similar in functionality and handling. Nevertheless, each device has its own characteristics that cannot always be ignored while describing the results. A detailed description of the e-book readers can be found in the appendix 8.3.

### **5.1. For what purposes are the e-book readers used?**

Use and usefulness of e-book readers were closely related, which will be explored in more detail in the following sections. However, to frame this discussion, this section will describe academics' main uses for an e-book reader.

All participants saw a clear advantage to using an e-book reader, in terms of its portability and its capacity to store large quantities of digital text that could be read anywhere. Although, as we will see in the sections below, storage was not without its problems, the portability was valued and the e-book reader was used by participants in different locations to read.

I did use it on the train yesterday going up to North London for a meeting and that was really good. [...], it was a convenient way so I left the paper at home and took the Kindle (WHS 152).

Reasons to use an e-book reader were broadly similar to those mentioned in the grey and academic literature (cf. Gustafsson, 2009a; Janssen & Martin, 2009; Wilson 2003), such as portability, reduced weight of reading materials, decreased printing and optimising their use of time. All participants indicated the need to read large amounts of documents which are available in a digital format, primarily academic journal articles, and also committee papers, minutes, module guides, textbooks, student applications, and documents related to their academic subject and organisational duties. Most participants also valued the crossover between work and leisure, as most carried novels with them as well as work, and almost all participants had read these documents from the e-book reader. Interestingly, environmental objectives were only explicitly mentioned by one participant.

I mean the reason why I invested in a digital reader originally was to be able to read documents on the move basically without having to carry around lots of paper. I have quite a long commute so it seemed to make sense [...], having a digital reader to read journal articles particularly (TCS 4).

Besides reading text related to their subject or profession, 4 participants explored the e-book reader's usefulness for teaching and learning; the duty of reviewing student work takes considerable time, and an e-book reader which allows digital marking could make this activity more flexible and efficient. Although, for reasons mentioned below, this was only explored briefly by most, one participant succeeded in using it for this activity.

I found changing the environment easier to [mark student work, ...], I guess, working at a desktop you end up getting distracted by things like email coming in (VQS 47).

Two participants tried to use the reader in the classroom to reduce the need to print manuals, handouts, readers and timetables, which might not even be consulted and will be disposed of afterwards.

I would open this very quickly and I would be able to tell the students what we are doing next week and what the reading is, and that eliminates the need to carry the printed version of the handbook with me. So that I have in fact used (NUS 88).

The functionality to distribute documents over the Amazon e-mail client to the Kindle e-book readers was also seen as useful for distributing committee or course papers etc., but this was not further explored, as it would only be feasible to implement if this became a widespread standard. However, the e-book readers were seen as useful for organisational duties, because committee papers did not have to be printed, and at least two participants actively used it for this reason, although:

I cannot really comment on the usability of it in reading the documents in the meeting because I did not have to read them! (NUS 19)

Besides professional interest, most participants explored the e-book reader for leisure, or, as one participant admitted, "I literally just used it to read a novel" (BTP 20). Except for two participants, who did not read text for leisure, all other participants did so alongside their academic texts.

It remains to be seen whether all these uses could be fully realised, and will be continued after the project. Use was related to e.g. the e-books readers' ease of use and the academic context of use, which will be explored in more detail in the next sections. Participants had more objectives, but as these remained hypothetical and were not actively tested, they will not be reported here.

## **5.2. Subject's interaction with an e-book reader in the academic context?**

This section will investigate the participants' interaction with the e-book readers, starting with general experiences and initial engagement. After that, the ease of use of an e-book reader in an academic context will be investigated, because as Kukulska-Hulme (2005b) argued, investigating the HDI and ease of use, especially in context, is an important aspect of usability.

### **5.2.a. Ease of use**

Getting started was uncomplicated for most participants, e.g., navigation to a text from the main menu and navigation within a text was unproblematic. Only one participant had problems transferring digital text from their computer to the reader. Connecting to Amazon or gathering digital text by other means e.g. downloading books in the public domain from [gutenberg.org](http://gutenberg.org) was without problems.

In terms of connecting up to my PC and my laptop to access documents, then that was really fine [...]. I am not particularly computer comfortable in some ways, but it was easy; you plugged it in and it gave you the right messages [...] (GQP 15).

In general, the e-book readers were experienced as robust, convenient in weight, small enough to put in your pocket or briefcase, and, as all the readers had a case, sufficiently protected against damage. Participants were positive about the screen and had used it in the train, bus, at the station, office, home and holiday. The reported portability and robustness of the e-book readers by participants supports the findings in the literature (e.g. Janssen & Martin, 2009; Shieh, 2009).

Participants who had experienced more than one reader often preferred one to the other. This was the case for different reasons, e.g., time spent and familiarity with one particular reader influenced preference, because participants who experienced

two readers mostly preferred their own. Preferences for a particular functionality e.g. WIFI connection or SD card memory slot played a role as well. However, there was one significant difference between the Kindle and the Sony PRS-600. The Sony was a touch screen device, making it possible to take notes with a stylus, which made note-taking easier. However, as participants noticed, in comparison to the Kindle, the text displayed was less crisp and clear.

[The Kindle is] a little bit more crisp and that is because the [... Sony PRS-600] got this touch-screen version, and they have to put an extra layer on it – which puts a little bit more glare on it [...] (GQP 19).

### **5.2.b. E-ink and PDF's**

In essence, the e-book readers are a display technology, and E-ink is one of the main selling points according to the grey literature (e.g. Siegel, 2009). Most participants recognised the quality of the E-ink display, although this did vary between devices.

[...] the screen is beautiful [...], I think that is the strongest point about kindle (QTS 44).

However, as participants were familiar with different display technologies and not all participants saw the benefits of the E-ink displays, they were not convinced that E-ink was better on the eye. Although they were often initially surprised by the similarity with paper-based text, over a longer period of use, not every participant found the display crisp and clear. Screen glare and difficulties reading under different lighting conditions were often mentioned. Furthermore, in comparison with print and smartphones, e-book readers often lacked clarity and contrast, especially with smaller font types.

I do not find it [E-ink] as easy to read as if I was reading an iPod or a Blackberry (VGP 112).

This is in contrast with the expectations of E-ink proposed in the grey literature, where the resemblance to paper and the clarity are noted as being important selling points (e.g. Siegel, 2009). An individual being used to a particular screen, might play a role in their appreciation of a particular screen. However, the different experiences reading from E-ink screens might need a follow-up study, in order to clearly differentiate between the expectations and the experiences reported here, especially if e-book readers become used more intensively. Here we can only conclude that participants had mixed experiences with E-ink displays, and their ease of use for reading.

Most participants found the responsiveness of the e-book reader and the refresh rate very slow. Every action e.g. the time it takes to navigate from the menu to a book, flip between pages, and the time between scribbling notes and seeing them on the screen was long, and resulted in a 'disjointed' experience (QGS 217). This observation is absent and not discussed in the literature, but should be considered, as slow responsiveness affected the users' experience negatively. This was not always problematic for the duration of this trial, or for leisure use, but as participants mentioned, it would challenge intensive and long-term use. For one of the participants it was the main reason not to continue using an e-book reader after the trial, let alone buy one.

The refresh issues with E-ink device I find [...] frustrating, it takes a second maybe to refresh a very complex page and especially if you are skimming a book looking for information, you want the ability to flick through quickly (QGS 29).

As identified in the literature review, an important indicator of the ease of use in an academic context is the handling and display of PDF files, as e.g. journal articles are available mainly in this format (see p. 11). All participants unanimous agreed that text



formatted in PDF resulted in a poor display on the e-book reader. PDF files are cropped on the screen and displayed in what participants considered to be an unreadable font size. Participants had to make adjustments to increase the font size, but that did not improve the readability of the text immediately. The Kindle and Samsung E-60 use a zooming tool to enlarge the font size, which resulted in the display of a block of text with half-displayed sentences. Continuing reading the other half of the sentence required zooming to the second block of the text and then back to the first block, in order to continue, or read a new sentence, see Fig. 5.

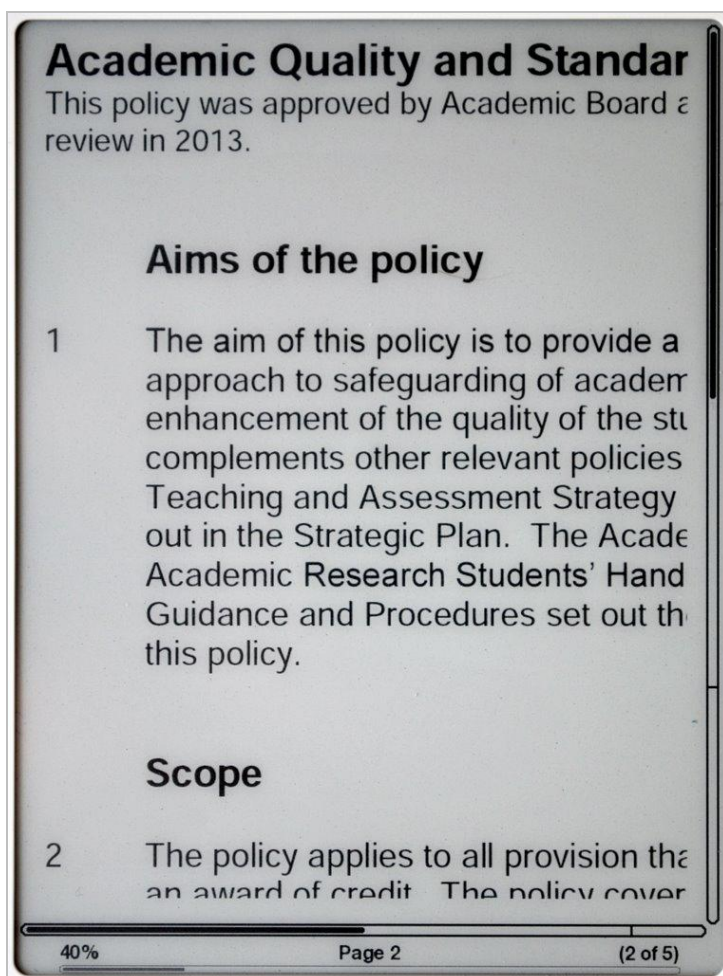


Fig. 5 Display PDF file using zooming tool (150%) on Amazon Kindle

The poor display of PDF is recognised in the literature (e.g. Janssen & Martin, 2009 and Kolowich, 2010 both report similar complaints from students). In all fairness, it is important to note that e-book readers have a 6" screen, while journal articles are

formatted and printed for A4 or 11.7". While some participants expected compromises, they had not expected the reflow of text to be so cumbersome. This was a surprise for most participants. Additionally, not all PDF files are the same, and some publishers (of especially older journal articles) format the text in such way, that the PDF files become very large and consume a lot of memory. As a result, the PDFs take a very long time to display due to the loading time needed.

[...] it does not cope well with large file sizes. [...], but primarily [...] it takes a long time [...] and sometimes I have had to give up [...] (TCS 22-3).

There were also problems related to the display of illustrations in PDFs. Academic articles often contain tables, graphs, maps and images to support the text and these need a clear visualisation. However, the screen size of the e-book reader was often too small, so that only part of the illustrations was visible, and often it was impossible to navigate to the other parts. Also, participants mentioned that most images lost their clarity if they zoomed in or out. Larger tables faced similar problems, and often the numbers in tables were out of alignment with their column. As a last example, some illustrations could not be displayed or accessed at all, or only after considerable patience from the participants. In all, illustrations were difficult to view and consult, a finding that is, as yet, not described in the literature related to teaching and learning, but might well affect students.

It will present the figure, but because of the size of the screen, if it is anything more than a small figure [...] it will be difficult to see what is [...] (TCS 24).

In contrast, text that was given in a native or preferred e-book reader file type, or text that had been converted to such a format, did result in a pleasant reading experience. This text used the whole screen, reflowed well after adjusting the font size and did not result in half broken sentences or paragraphs, although patience

was sometimes still required with illustrations. However, as journal articles are not usually available in these file types, and only one participant took the effort to convert text to a native file, the problems with PDFs hampered reading academic text. Most participants persisted for the trial, but did not want to continue reading PDFs on an e-book reader after the project had finished.

Nonetheless, reading text for leisure was a different experience, as most texts for this purpose were available in the native files types. Since the font size of text in a native file format could easily be adjusted, this increased the accessibility of text, as Larson (2010) suggests. This was confirmed by more than one participant, who said that text on the e-book reader did reduce the need for reading classes. This added to the mobile experience.

### **5.2.c. Simplicity**

The ease of use, was, for some participants a pay-off for the device's limited functionality, especially in comparison with another technology e.g. smartphones. The functionality of an e-book reader was experienced as rather basic and 'very simplistic', which resulted in mixed responses (TCS 109). On the one hand, it made the device easy to handle and understand, but on the other, 4 participants who were smartphone/PDA users, found it too simplistic. They used their smartphones for similar purposes e.g. to use their moments of free time more effectively, as mentioned in the literature (e.g. Clough et al., 2009).

I think [my smartphone] is really a very efficient use of your time [...] whenever you have some dead time (QTS 46-56).

The e-book readers was described as 'old', 'slow', 'simplistic' and 'kindergarten' technology (e.g. NUS; TCS). For some, the limited functionality reduced the feasibility

of work-related activities, and/or the flexibility to switch from activity to activity. For this reason, some participants saw the single-purpose e-book as inflexible and over-simplistic. This observation supports criticism from authors in the grey literature, who also had reservations about the usefulness of this single-purpose device (e.g. Bilton, 2010; Stahmer, 2009). For one participant the simplicity of its functionality was one of the main reasons they gave up on the trial at an early stage. However, not all participants saw the lack of functionality as a limitation and could see themselves using multiple devices at the same time for different purposes, as they are 'complementary rather than competing' (VQS 124).

#### **5.2.d. Conclusion**

To conclude, the e-book reader was easy to use and handle, and was useful because it could be taken everywhere and used at anytime. However, e-book readers do not generally display PDF documents very well, which compromised their usefulness in an academic context, where this format dominates. This challenges claims from the literature, e.g. the Horizon Report's (2010; 2011), which allege that e-book readers have become a feasible alternative to print in an academic context. Furthermore, the value of E-ink as a screen to read from received mixed opinions. Although most participants initially found that reading from it was a pleasant experience, the lack of clarity, the slow responsiveness and the lack of other (interactive) functionality outweighed the advantages for some participants. The mixed reactions to E-ink might need a more specialised study, e.g. to compare eyestrain and clarity between different display technologies, and to investigate the quality of E-ink in more detail.

### **5.3. Did additional functionalities contribute to use?**

This paragraph will investigate the additional tools available on some e-book readers. As we have seen above, E-ink as a display technology resulted in mixed experiences. However, in addition to being a display technology, the e-book readers in this project had additional functionalities that could enhance the reading experience, e.g. note-taking, highlighting, bookmarking, adding a 'dog-ear' to a page, text-to-speech and an inbuilt dictionary (see appendix: 8.3. for a full list). As discussed in the literature review, this functionality might be useful in an academic or educational context. This chapter will review the use of this additional functionality. In particular, it will be compared to existing (non-digital) practices and habits.

#### **5.3.a. Text-to-speech and internet**

Some functionality, such as displaying images, playing sound files and having access to the dictionary, were seen as interesting and of educational value, e.g. for a field trip, but these were not further trialled. This was partly due to the length of the pilot, but also because the participants saw some functionality (e.g. the dictionary and text-to-speech) as being useful primarily in specialised teaching and learning environments, e.g. to enhance the learning of English as a second language, as in Larson's case (2010). The text-to-speech functionality had an appeal for three of the participants, although more for leisure reading than for work. For example, participants reported using podcasts and audio books when commuting to work, and were interested in listening to texts via the e-book reader; however, the two participants who used text-to-speech did not like it. The voice was experienced as poor and very 'instrumental', and did not mirror previous experiences with audio books or podcasts. Furthermore, it did not work with PDF files. This challenges the claims from the grey literature (e.g. Gustafsson, 2009b) and the academic literature

(e.g. Larson, 2010; Wines & Bianchi, 2010), which suggest that these functionalities will add to engagement with texts. However, the quality demands of text-to-speech in the context of teaching and learning will be different to the expectations from an audio book in a leisure context. The quality of the voice might be less important if students need only to check the pronunciation of a single phrase, rather than when listening to a whole text.

I found it [text-to-speech] difficult to understand [...], so I was surprised, because [...] I have in the past [...] listen to a lot of books and plays on my iPod (VGP 18).

The Amazon Kindle used in this project came with a wireless internet connection, an interesting additional functionality for most participants, as this broadened access to reading resources and made the device's functionality closer to that of a smartphone (e.g. checking e-mail). This positioned it between work and leisure since it could be used for both purposes. However, the 3G connection was experienced as being very slow, and the browser was very basic and unable to open work e-mails (e.g. by Outlook Web Access). The internet connectivity was seen as a 'fantastic selling point' but had no practical utilisation, and could certainly not live up to everyday experience of internet access e.g. via a smartphone (NUS 116).

### **5.3.b. Note-taking and highlighting**

All e-book readers used in the project allowed note-taking and highlighting, functionalities that were absent in earlier e-book readers, but which were identified as being important (Wilson, 2003; Kolowich, 2010). As we will see in the next paragraph, the use and usefulness of this are closely related to existing patterns of working. Note-taking and highlighting were, in general, not seen as difficult to learn or to handle, even though each device had its own specific handling technique.

The Sony PRS-600 and Samsung E60 came with a stylus to take notes and highlight passages. The scribbled notes were clearly visible on the documents after being made on the Sony PRS-600 and Samsung E60. The Kindle did not have a stylus, and notes had to be typed with a small keyboard, which took considerable time; they were also somewhat hidden in the text and did not work on PDF files. The ability to scribble on the Sony and Samsung seem, initially, to suit participants' aims, e.g. to annotate research and committee papers, and to mark student work. However, only the Sony PRS-600 allowed the notes and scribbles to be exported. As a result, the scribbles and annotations seemed to be 'locked' in the readers, and could not even be copied. They could not be disseminated to students or colleagues, reducing the usefulness of this function, especially for digital marking.

You would definitely want to be able to transfer them to the PC, [...] print them out or whatever to make them more usable (BTP 138).

All of the e-book readers had a special notes section in the main menu, which contained a list of all notes and highlights taken, and allowed navigation to the particular document where the note had been taken. Without going into too much detail, as only a view of the participants explored this, it seemed to be a useful feature, but it became quickly clear that it had no additional value, as the list became long after extensive use, and meaningless, as it could not be sorted, renamed or labelled in any way. These findings challenge the claims of e.g. Wines & Bianchi, (2010), that the note-taking and highlighting functionalities are useful for students, to organise their work.

### **5.3.c. Conclusion**

To summarise, the e-book readers used in this study come with interesting additional functionalities, such as text-to-speech, note-taking and highlighting, which, in the

literature review, were seen as necessary and useful in a teaching and learning environment. Academics saw the potential usefulness too, but in practice did not use these features for long. The audio quality of the text-to-speech feature was poor. The internet was slow and the web browser functionality limited, and the utilisation of the note-taking and highlighting features did not mirror paper based practices, making them difficult to use for activities such as marking students' assignments.

#### **5.4. What existing practices might an e-book reader substitute/supplement?**

In the interviews, participants mentioned that reading formed a considerable part of their work and that they had to read for different purposes, e.g. to keep up with their academic discipline, committee papers, student work, and drafts from colleagues. Furthermore, they developed different reading strategies to read for these different purposes. Additionally, participants mentioned that reading in an academic context, is closely related to writing. Journal articles that are reviewed and annotated might be used for further reference in their own writing and publications. Consequently, participants reported many different ways of engaging with the text, including keeping notes and organising their reading materials. E-book readers need to fit somehow into these different routines, if they are to be used in this academic context. This fit will be explored here, particularly in terms of highlighting and note-taking to keep track of what is read, and the organisation of reading materials. Lastly, participants indicated that they had a relationship with paper books, which affected the usefulness of e-book readers in an academic context.

Participants mentioned several different reading objectives regarding academic text. After text was downloaded from online aggregators, or collected by other means, it was skim-read for relevance, sorted into folders or collections, and subsequently



read more intensively. In the process, notes were made, sometimes in the text, either on screen using Adobe software, or in a parallel notebook. Passages were highlighted, and annotations, tags, mind maps and/or summaries were added. Further references and/or quotations were marked or copied, and additional navigation was added e.g. with the use of post-its or dog-ears. Below, we will see how e-book readers could support these different activities.

#### **5.4.a. Reading from E-ink for academic purposes**

E-ink, as we have seen above, received a mixed reaction. Here we will see that the objectives of academic reading and the routines associated with it, contributed to this.

Some participants, but not all, believed that reading from E-ink screen made their reading pace slower, in comparison with reading from a paper book. This was not necessarily due to the text display, but could also be because the reader allowed them to read in spare moments, leading to a fragmented experience, and giving the impression of a longer duration.

A slower reading experience was also due to the habit of underlining that is often necessary when reading for academic purposes. Counter-intuitive as it might sound, for some, underlining while reading an academic text increases reading speed, as the participants knew they would find passages again, and this focused their concentration on the text. As underlining or highlighting on the readers had limited benefits, as seen above, most participants gave up underlining, and had to concentrate on the text. In addition, going backwards and forwards in the text to look

at other sections, images, etc., as discussed above, also contributed to the experience of a slower reading pace.

Furthermore, the screen size of the e-book readers used in this project was 6" in all cases, which is considerable smaller than printed journal articles or book pages, especially textbooks. The amount of text displayed on the screen was less than participants were used to, and skipping a passage was harder, which also slowed their reading. For two participants, this contributed to a positive experience, increasing their concentration on the text, as less text was displayed than usual. This is something that is supported in the literature by Wines & Bianchi (2010). However, this experience was not broadly shared among the participants.

I just thought it worked particularly well, focusing your mind just on that, so you weren't distracted by lots of other text [...] (TQP 131).

Almost all participants experienced skim reading journal articles on the e-book reader as problematic, and mentioned this explicitly. Displaying less text made it more difficult to get a quick overview. Furthermore, books and printed journal articles seem to be more versatile, allowing readers to flip backwards and forwards and browse multiple pages at the same time. This took considerably longer on the e-book reader; an experience confirmed by all participants. This also affected the reading of digital committee papers, minutes, notes, students' assignments and student applications.

So [...] I think that was probably one of the main reasons why I stopped using it for academic reading, because it was such a hassle to leaf through a book (TCS 32, 67).

Reading on an e-book reader seemed to impose a linear reading strategy on the participants, and forced them to read more from cover to cover. This experience is

supported in the literature (cf. Kolowich, 2010; Ugletveit et al., 2009). The e-book reader effectively prevented skim reading for academic purposes.

Nevertheless, some participants found a way around this for the duration of the project, by making adjustments e.g. by switching to landscape view and/or using a small font size, but did not see this as a feasible way of working after the project had finished. Nonetheless, as journal articles have in general a consistent layout and recognisable sections (such as abstract, introduction/literature review, methods, results and discussion), and as these parts are clearly distinguishable, this made it possible for one participant to skim read academic articles on a e-book reader. Lastly, some participants had selected text prior to transferring files to the reader, removing the need to skim read on the e-book reader altogether.

Participants mentioned two more reading purposes related to academic contexts: non-linear and parallel reading. Reading for academic purposes can take place in a non-linear way e.g. when text is being used in preparation for academic writing. The constraints for such non-linear reading were similar to those for skim reading.

[...] it is about the non-linear nature of academic reading [...], there is a certain system in the chaos when you are sort of flicking through papers on the table, this [...] forces you into certain paths that are not necessarily conducive [with an e-book reader] (TCS 95).

In general, participants were used to certain freedoms when reading paper books and journal articles, similar to, but more elaborate than, skim reading. They mentioned:

- textual orientation by flipping backwards and forwards,
- browsing other pages for text, images, tables, graphs, while keeping their finger on one page,

- checking references,
- searching by the index, or table of contents,
- apparently random searching for text or images, by flipping backwards and forwards,
- flipping through pages to the end of chapter to see how much reading needs to be done.

These routines, associated with paper text, become even more prominent at a later stage if text is re-read and consulted for writing e.g. to find a reference or quote. As mentioned above, flipping backwards and forwards, even to the beginning or the end of a book, took longer on an e-book reader.

[...] you cannot kind of get attracted by a diagram on the next page which you sort of jump to and [...], so that global overview is not there. (GQP 101)

Non-linear reading was identified by most of the participants as an important aspect of academic reading. In contrast to skim reading, which is mentioned in the literature, the importance of non-linear reading and the problems faced doing this on the e-book reader, are previously unrecognised. Nevertheless, texts that can be read non-linearly for leisure resulted in a different experience, as we will see in the next section.

A further aspect of reading in an academic context was identified. In contrast to reading a text for leisure, in an academic context, text is often read in parallel to other texts. Although some readers would argue that they read different novels in parallel to each other, academic texts often refer to other texts, and so can be read in conjunction. For instance, participants mentioned checking references, for example by verifying a quote or an argument in different texts. This was often accompanied by underlining, note-taking etc., in the original text or in a parallel notebook. While

writing, this process becomes even more intense, as important passages, quotes or references in multiple texts, need to be checked and found. Participants mentioned that, when doing this, they are often surrounded by books and papers, and may have multiple documents open on their computer. Because the e-book reader could not open multiple texts at the same time, and the process of going back to the main menu, opening a new text and going to the right page took so long, it was not seen as feasible to use it for parallel reading.

If you are reading more than one book at a time, actually having them physically in front of you is much more of an advantage than trying to cross-reference them on one device (BTP 91).

Again, the importance of parallel reading of multiple texts in an academic context, and the need to switch between documents, is unrecognised in previous literature.

#### **5.4.b. Note-taking and academic reading**

Parallel and non-linear reading is often accompanied by note-taking, underlining and/or highlighting. All participants had strategies to keep a “certain system in the chaos”, and developed individual ways to engage with the text, and to archive their thoughts for future use (TCS 95).

I absolutely have to, because if I just read it and I do not highlight, underline, or make notes, it is as if I have not read it (NUS 38).

Although the approaches were often highly individual, as Ugletveit et al. (2009) observed, participants used similar means, such as:

- underlining and/or highlighting text as an indication of importance,
- writing notes or drawing a mind map to make summaries and capture ideas, either in the margins, on top of the page, or in a separate notebook, or on the computer using the Adobe suite,

- the addition of post-its in the margins or using dog-ear folds, to provide extra cues for further reference e.g. to finding passages.

All this supported participants' engagement with the text and provided reminders for future uses.

Because that [notes] is like having a big sticker on the side of the page which you can go back to, and remind yourself why you were interested in it (GQP 125).

This variety of practices and tools did not easily transfer to the e-book reader. This was not a problem for some participants, as they could use the e-book reader in parallel to their existing routine, such as taking notes in a separate notebook. However, none of the participants, not even the one who owned an e-book reader, changed their routines of highlighting, underlining and note-taking due to this trial, as working with paper copies was seen as more flexible and effective, especially as notes on an e-book reader, as discussed previously, could not be transferred to a computer, easily accessed, or organised. The need for highlighting and note-taking tools on an e-book reader is recognised in the literature (e.g. Wilson, 2003; Janssen & Martin, 2009; Kolowich, 2010); nevertheless, the problems of using these tools have not been explicitly investigated in the literature.

I liked the idea but operationalising it has not been as useful as I had originally hoped (TCS 122).

As a last point on this subject, none of the participants felt any restraint when highlighting, underlining and/or taking notes to engage with academic journal articles. Interestingly, this was not necessarily the case for all academic text. Almost all of the participants mentioned an affectionate relationship with certain books, as we will see below.

When it comes to reading books, I do not tend to highlight them, that is mainly [because of] the relationship I have with books, I like them sort of to be clean. [...] of course I do highlight the books that I care less about, [...] a], textbook [as] there will be another edition in a few years time (TCS 111).

#### **5.4.c. Organising documents**

Before we investigate non-technical customs, another habit related to academic text needs to be discussed. Participants indicated that they held large numbers of digital documents on their computer, and mentioned different ways of organising these. Some academics had strict conventions, of renaming and storing the documents in folders on the computer after downloading them from the internet or library aggregators, while others did not do this. Such conventions included using the name of the author(s), part of the title and/or the year of publication. Articles were clustered together around a task, theme, method or research project, the name of the journal, the year of publication, etc.; often, one article could be found in more than one of the folders. Only one participant mentioned using reference management software to keep hold of digital journal articles. If articles were printed and filed after reading, some participants mirrored the digital collections in their organisation of the documents, but others did not.

As mentioned earlier, transferring files from the computer to the e-book reader was not seen as problematic. However, all participants found that transferred PDF files were difficult to find in the index of the e-book reader. PDF files could not be found under the name participants had given them, because, unknown to most, the e-book reader had indexed the files using text from the file's meta-data. At best, this may have included the name of the author and a small piece of the title, but in the majority

of situations, titles looked like a long random number, and/or part of a date and journal name.

[...] so dragging and dropping PDFs off [...] of my PC straight into the drive [...] But, then they would lose their new names and [...] made] it impossible to track what you are actually reading (GQP 27).

This made it difficult and time consuming to find a specific article to read, especially if a large collection of documents had been transferred. Multiple documents had to be opened to find the right one. Given that renaming files after transfer was not possible, this was not seen as a feasible way of working. This is in contrast with the potential usefulness mentioned in the grey literature (cf. Gustafsson, 2009b), to store and organise large quantities of digital text on the e-book reader. This problem with indexing could be overcome for the period of the trial, as most participants had only copied a limited number of files, but would hamper long-term use. None of the participants found a reasonable way around it.

#### **5.4.d. Our relationship with paper books**

As we have seen, participants regarded books and printed papers as being more flexible for skim-reading and non-linear reading. In addition, printed books also support the reader in another way as described by Ugletveit et al. (2009). The strategies used by children in their studies to assess their books were similar to those that participants mentioned, e.g. how long it would take to read. A partial list of criteria is:

- weight and size,
- number of pages and chapters,
- font size of the print and density of the text,
- amount of images.



Furthermore, participants mentioned assessing the content, by looking at the table of contents, the excerpts on the back and snippets from the text. As discussed previously, paper books have advantages over e-book readers for such sampling. In all, these assessment strategies are not easily mimicked on an e-book reader.

[...] like being able to judge the size of the book and how long it would take me to work with that book [...] (WHS 94).

Another point mentioned by 5 participants, which is also supported by Ugletveit et al. (2009), is an affective relationship with books. Some books are treated with respect and would never be personalised by highlighting, underlining, or scribbles; not even a post-it note could be added. Of course, this feeling was not shared among all participants to the same degree, but most participants mentioned that a book could be seen as a desirable object. Reasons given were:

- the book or/author had certain status in the academic field, e.g. scientific or historical importance,
- the book itself was rare, e.g. a special, first edition or signed copy,
- they had a personal relationship with the content or author.

[...] you cannot have a signed copy of a book digitally; it just would not be the same thing. [...], having the hard copy has a certain sentimental value (TCS 76-8).

4 out of the 10 participants mentioned having become more aware of their personal relationship with books during the trial. They consequently re-evaluated paper books more positively. Grouped together on the shelf, books have more than an academic value; the collection represents a certain autobiographical importance. These affections for the paper book were seen as difficult to mirror in a digital version. However, some participants wanted to have books in both formats for pragmatic reasons i.e. to get the best of both worlds.

In addition to the appreciation of a book as a physical object, some participants mentioned that reading from a book provides a certain pleasure. The satisfaction was not only related to the item, but also to the act of reading, which was often associated with a special moment in time and place to read, preferably undisturbed. These participants indicated that reading from an e-book reader was not the same; however, this affection for the book as an item, the feel of a book, and satisfaction while reading, might be culturally embedded and could change over time.

Participants who discussed this element indicated that it was unlikely that they would give up their paper books after having experienced the digital reader.

[...] I am just wedded to books I suppose and I have plenty of books to read, I like the feel of a book, [...] (TQP 51).

The participants did not treat all books with respect; many books were seen as disposable and could easily be replaced by digital copies. Moreover, some participants mentioned that they could envisage having a digital version of the same text. The contrast between the aesthetic attachment on the one hand, and disposability on the other, was even greater when it came to books which they read for leisure. The personal attachment with an edition or author was stronger, but for other text, a digital copy was more than sufficient, as they would never read it again.

Participants' preference for hard copy text was not only driven by personal attachment. Some reasoned pragmatically that hardware and file types would change and evolve, whilst key academic texts in paper copy could still be consulted in years to come. Their e-book reader and files might be obsolete, unsupported, and thus unsustainable within a couple of years, or even earlier, as some participants found out:

So I tried to get a charger and [...] I could not find one because they seem to have discontinued this particular model [... . . .], this [book], I am going to be able to read, [...] as easily in this format in 50 years' time (TCS 160-4).

#### **5.4.e. Conclusion**

To summarise this section, participants' routines, habits and conventions in academic reading are often difficult to accommodate using an e-book reader. To a certain extent, this confirms Kukulska-Hulme's argument (2005a), that the usefulness of a mobile technology is not only related to issues of Human-Device Interaction (HDI), but is also related to its specific context of use. The HDI of the e-book reader, such as slow navigation from the index to a book and through a text, might be acceptable for less demanding reading (e.g. for leisure), but academic text is often read in a non-linear fashion and parallel to other texts. Here, the slow navigation, the time it takes to flip backwards and forwards, and the inability to open multiple texts at the same time, become a hindrance. Additionally, the capacity to take notes might be sufficient for an occasional reminder for the leisure reader, but it is unable to support the intensity and variety of individual annotation styles used in the academic context. Furthermore, e-book readers have very different conventions for storing and indexing documents than academics are used to. This will not be a concern for the leisure reader, who retrieves novels from Amazon, as the meta-data will be correct. However, in an academic context, documents are retrieved from multiple sources that have different conventions, and academics have developed their own ways of naming files and organising them into folders. This was not supported by the e-book readers.

Finally, participants continue to have an attachment to certain printed books. As Ugletveit et al. (2009) showed with children, academics value paper books for

several reasons, which could not be mimicked by electronic versions. The next section will consider this issue further, from a different angle.

### **5.5. Why, and in which physical contexts are e-book readers are deployed?**

In the previous sections, the subject of location of use was touched on. This section will explore the different locations in which the participants used the e-book readers and the reasons for this. The locations of use included: the office, the train or bus while commuting, and, a hotel or rented apartment during annual leave. For teaching and learning purposes, the e-book readers were also used in the classroom.

An important location of use was at the participants' desk, close to the computer, which allowed them to transfer documents. If participants were close to their desk, the e-book reader did not change their reading practices. Participants continued to read from their computer screens or papers, because in the office, reading was just one of many activities they had to do, and the computer was more practical to support this, as documents could be printed with ease when needed.

Some participants used the e-book reader in the context of teaching and learning; one used the e-book reader twice in the classroom. Text, such as tutorial questions, handouts and timetables, was read from an e-book reader instead of being printed. These texts are only consulted occasionally, and so the e-book reader served as an alternative to a printed version. However, across these two uses, the reader was consulted only once, and this does not really provide sufficient evidence of its general value.

Other text used in the classroom (e.g. textbooks) required quick access and good navigation, as time in the classroom with large groups of students is precious. The e-book reader was experienced as slow, and therefore unsuitable for this activity.

when you have 100 or 200 people in a classroom, everything has to be very simple, very straightforward [...], so I didn't feel confident [using the Kindle] (QTS 25)

Several lecturers tried to mark students' work on the e-book reader, but could not since the notes and scribbles could not be exported. One lecturer found a way around the poor display of PDF files by supplying the students with a template to complete their work. His routine did not require scribbling on the students assignments (he used a separate notebook), and notes were disseminated to the students in different forms e.g. as podcasts. This participant was able to use the e-book reader for this purpose; interestingly, however, and a deliberate change in location helped him to focus on this part of his work.

Concerning reading academic text, all participants saw the opportunity to read away from the desk as a very interesting feature. The e-book readers' portability and light weight had great appeal. At least half of the participants mentioned being away from their desk regularly for professional reasons, such as attending offsite meetings and committees, visiting industry partners, meeting students and attending conferences.

[...] so it has become a bit of a realisation that mobile computing and mobile access to my work is actually something which I really appreciate now (QGS 101).

Whilst commuting, the reader was not used exclusively, but as one source of reading material, depending on what content was available and the mood the participants were in. Having several texts available on one device, without the bulk of printed articles and books, and being able to mix reading for leisure and work, gave freedom

of choice and was seen as a great asset. This is supported in the literature; e.g. Janssen & Martin (2009) found a similar appreciation among distance students. Furthermore, although not relevant to all participants, the fact that the font type could be adjusted was seen as a practical feature, enhances the usefulness, as it reduces the need for reading glasses.

I did take pretty much everywhere so I was using it on the tube and train and the bus, you know, so essentially anywhere that I had sort of 5 minutes (BTP 79)

Some participants mentioned that reading text from an e-book reader could optimise their time management (cf. Clough et al., 2009). Short periods of time could be used to skim-read through a couple of documents, and text that warranted further reading could be selected. In practice however, this was only theoretical for most participants (all but one), because of the problems associated with skim reading, mentioned earlier.

It is maximising my time [my ...] tube journey at the moment is very short, [...], so with that time you do not get anything major done [...]. But, you could pull out this device and scan a couple of articles and just see if they are of interest and discard things but not [...] (GQP 55).

Several participants had taken the e-book reader with them on annual leave, and all of them saw its appeal in the crossover between leisure and work. Again, participants valued the chance to carry large quantities of text on an e-book reader without increased weight, as is recognised already in the literature. Additionally, in contrast to Beetham et al. (2009: 3), participants mentioned that “boundaries between work, leisure and learning, between home, school and workplace” were already eroded, or had never been very strong. All but two participants, who did not make any work-leisure differentiation in their interviews, carried and read text for both purposes, depending on their mood, priority and the time of the day, etc. This was deeply

rooted in participants' routines, and the e-book reader seemed to extend this seamlessly.

All of the participants carried text for leisure and work purposes even on annual leave, and mentioned that this had been the case. Having it with them did not mean that they read work text, but it was there "just in case you feel like doing it" (TQP 197).

[...],so being able to take work documents and leisure reading without having to think about it, just shove it all in your bag and then you do not have the guilt of not having your academic reading with you, and you can also ignore it quite happily and read something more fun (GQP 47).

As discussed above, all of the participants tried to read academic text on their e-book reader, but most gave up. However, certain text was read with pleasure from the e-book reader, e.g. a novel that was downloaded on the reader in a native file type. This made good use of the display, compared to PDF files, and was easy to read. Four participants admitted that they had read a complete novel on the e-book reader during the trial, and would continue using it for that purpose. These texts were read with a different objective, and did not require non-linear reading, flipping backwards and forwards in the text, parallel reading with other texts, note-taking, etc.

I mean when you are reading for pleasure you are reading to derive something from the text in a different way than when I am reading a journal article (TQP 40).

Reading for leisure on an e-book reader was reported as being uncomplicated and a feasible alternative to print. Nevertheless, the ambiguity of participants about printed text for leisure was even greater. On the one hand, participants mentioned the strong 'sentimental values' of some books, and participants could not imagine reading

electronic versions of certain novels in the same way, because “e-book readers are slightly colder and are a more impersonal experience” (BTP 163). On the other hand, participants also clearly stated that most text for leisure was disposable and therefore a digital version was sufficient, as it was never read again and read copies would only consume valuable space. (These differences are consistent with Ugletveit et al., 2009).

To summarise, e-book readers are appreciated for their weight and portability. The ability to store large quantities of text, that can be read anywhere and anytime, serves the purpose of reading for leisure and work well. In contrast to professional reading objectives, reading for leisure on the e-book readers was mostly experienced as uncomplicated. Although not all text could be replaced (for sentimental reasons), it was seen as an appropriate format for disposable text.



## **6. Conclusion and discussion**

This chapter contains two sections. The first will summarise the findings of chapter 5 and draw conclusions. The second section will discuss the limitations of the findings and some of the wider implications.

### **6.1. Conclusion and summary**

The previous chapter was structured using the subsidiary research questions (Table 2). This section will start by answering the main research question (p. 20), then summarise the main findings, and will conclude by review participants' use of e-book readers after the project.

#### **6.1.a Answering the research questions**

In this study, the usefulness of e-book readers as aids to the participants in their academic reading was experienced as limited, unless academics “have a very specific need for it” (QGS 195). This was mainly felt because the variety of objectives of academic reading, and the accompanying conventions of reading, storing, organising and engaging with text for academic purposes, could only be accommodated partially by the e-book readers used in this project.

#### **6.1.b Summary of the results**

As we saw at the start of the previous chapter, the participants expressed a desire to have a mobile device that could display digital text for work and leisure, as it would reduce printing and the weight that had to be carried around, and also increase flexibility. Participants found the e-book readers easy to use. E-ink, as display technology, resulted in mixed experiences, although most participants found it easy

to read. The e-book reader also had disadvantages for use in an academic context; the most important are listed below:

- display of relative little text at the time (especially compared to a normal A4),
- slow refresh rate, which hinders flipping backwards and forwards, navigate to different text to inspect images, graphs, references etc.
- inability to have multiple texts open at the same time,
- poor display, readability and adjustability of PDF files,
- limited ability to utilise note-taking and highlighting functionalities,
- inability to index, especially with large numbers of files.

These disadvantages hindered participants in achieving their objectives, such as reading for academic purposes. The display of PDFs was one of the main constraints, an observation that is well documented in the literature by e.g. Janssen & Martin (2009) and Kolowich (2010), although not in the same detail. This challenged the claim from the two Horizon Reports (2010; 2011), which argue that technologies like e-book readers have become feasible alternatives for the display of electronic text over print. Furthermore, academic practices such as skim-reading, non-linear reading and parallel reading were not easily supported by the e-book readers, as suggested by Kolowich (2010); however, this is not documented in detail. However, as PDF is an important format for academic text, the constraints associated with it need more attention, and a solution needs to be found, if e-book readers are to be used in an academic context. In addition, attention to the reported diversity of reading strategies e.g. skim-reading and non-linear reading should be taken as requirement, for the design of any reading devices that are to be used in an academic context. Nevertheless, this study confirmed the findings of Larson (2010)

and Wines & Bianchi (2010), , which state that the e-book reader supports intensive reading objectives.

The 'slow refresh' rate of the e-book, i.e. the time it took to open a book and flip through pages etc., constrained the participants' use of the e-book readers' considerably. This observation is absent in the literature, but is an important new finding, as this constraint hinders parallel reading of multiple documents, which is often a requirement when reading in an academic context. Furthermore, the slow refresh rate constrained the use of the e-book reader in dynamic situations such as in the classroom, as, e.g. navigation to key text took too long. However, this was no problem when an immediate response was less important e.g., for occasionally consulted documents and when reading for leisure.

Note-taking and highlighting was possible on the reader, but participants did not find it to be a feasible alternative to printed text for this purpose. Although some exceptions were found, in general, the note-taking and highlighting functionalities could not be utilised for the annotation of committee papers, students' work and research papers. The need for these functionalities is documented by, e.g. Wilson (2003) and Kolowich (2010), but the difficulties in utilising this functionality in an academic context are absent in the literature. This finding is significant, as adding functionality to a device that seems similar to paper-based tools does not automatically mean it can accommodate the variety of paper-based habits and practices, used in an academic context.

The appeal of storing large numbers of documents on a reading device, making it possible to read wherever and whenever, is well described in the literature (cf.

Gustafsson, 2009b; Horizon, 2010; Janssen & Martin 2009; Wilson, 2003), and was appreciated by participants. However, the problems associated with indexing large numbers of documents, which constrain its usefulness, are not documented in the literature. Attention to the indexation of documents on e-book readers or any reading device is required, as it needs to fit with current habits and practices of organising reading materials, if it wants to become a feasible alternative to print in an academic context.

As discussed, the disadvantages were less of a problem for leisure reading objectives. An e-book reader was seen as a feasible alternative to print for leisure reading, because the demands on responsiveness and functionality were less pressing, and text was often better formatted for the E-ink display. The majority of participants saw the crossover between leisure and work as an advantage, as carrying and reading text for both objectives was common practice. The better fit for leisure, and the benefits of crossover are not explicitly mentioned in the academic literature. However, as Beetham et al. (2009: 3) expect there to be an erosion of boundaries between leisure, work and learning, further exploration of this aspect will be required.

One non-technical constraint was found as well. The majority of academics mentioned feeling affection towards books as objects; this was the case for certain academic and leisure books, but not for all books. An affectionate relationship with books is reported by Ugletveit et al. (2009), in a study with young children, but has not previously been documented for academic staff. This aspect should be taken into account in further studies on reading devices, as it influences the outcome in a non-technical way, and can easily be overlooked.

### **6.1.c Continuation after the project**

As mentioned earlier, several participants had received or bought e-book readers, either before or during the project. This might be a good sign of their usefulness, and continuation after the project. However, except for two participants who want to investigate certain aspects further related to their professional interest, none of the other participants saw themselves using e-book readers for academic purposes after the project finished. Participants answered the question of whether they would recommend an e-book reader to another colleague cautiously. They “would not dissuade people from investigating” an e-book reader for work (WHS 137), but participants would almost unanimously recommend one for leisure.

For fiction, yes. Based on my experience of academic reading, I would not recommend it to someone to do academic reading (TCS 148)

This section has drawn conclusions and summarised the findings of this study. The next section will put the findings into context, by discussing the limitations of this study.

## **6.2. Limitations and implications**

The conclusion in the previous chapter is based on the empirical data, coming from a case study with a limited number of participants, taken from one university. The questions remains, as to how far the outcomes can be transposed to different contexts. To answer this, a discussion of the transferability of the results is needed, followed by the need for further research, and a reflection on the use of the theoretical framework. I will close this dissertation with some remarks on the adaptation of e-book readers for an educational context.

### **6.2.a. Transferability and credibility**

The transferability of the results coming from this case study is a critical point to review, especially as Bryman (2001: 56) summarises that “standard criticism of the case study is that findings deriving from it cannot be generalized”. As the theoretical framework was used throughout this dissertation, it is appropriate to discuss the transferability referring to the different activity theory concepts.

All participants were recruited from one university (community) that can be characterised as a typical post-1992 university. Therefore, care must be taken with the transferability, as the case may be un-representative of all universities in the UK. Nevertheless, care was taken to recruit participants from different academic subjects and backgrounds, to avoid dependence on a specific context of use. Even if typical for a case study, the sample group in this study was relative small, limiting the transferability. Although care was taken to recruit participants who represented the academic staff, the results might not be representative of another sample group, such as academic students. The usefulness was found in relationship with a specific piece of technology or tool. Nevertheless, different comparable e-book readers from

different companies were used, to avoid biasing the results towards one particular device, which contributes to the generalisability of the results. However, the value of the findings is very much related to the e-book reader. The use of other technologies, such as a tablet PCs, will result in a different experience. As the object of observation was 'to capture the circumstances' of 'everyday' situations, using a 'representative case', the results of will be transferable (Bryman, 2001: 56). As all academic staff and even students, might want to use e-book readers for similar activities (object and outcome) and will face the same problems with e.g. displaying PDF files.

Furthermore, other academic staff or students who want to use an e-book reader will have similar reading strategies and habits (rules), which, as we have seen, will be difficult to accommodate on an e-book reader. Lastly, this study was not a technical evaluation of an e-book reader, e.g. the problems with the display of PDF's were reported, but the cause of these problems was not investigated. Also, no attempts were made to overcome some of the technical constraints to enhance the usability experience. The researcher could have converted PDF files into a native file format, together with the correct metadata for the participants (division of labour). This would have enhanced the usability of the e-book reader in an academic context considerably. However, this would have made the results, to some extent artificial, and would reduce the transferability of the results.

Although recognisability of experiences is in itself an insufficient criteria, observations in this study are partially confirmations of observations in the academic literature, which contribute to a high degree of credibility. Furthermore, data was collected until the research questions were saturated, which contributes to both the confidence and credibility of the results. Lastly, care was taken to "adopt an auditing approach", to make the processes of data collection, analysis and reporting accessible to peers,

increasing the dependability of this study (Bryman, 2001: 378). Despite the trustworthiness of this case study, the result should only with caution, be transferred to different contexts, users and devices.

### **6.2.b. Further studies**

As mentioned in the conclusion, this study supports and challenges some of the findings in the literature. The transferability of this study needs to be taken with caution, and is primarily related to the research approach. Studies with different research methods, especially quantitative, at other educational institutions, and with different target groups will develop a more reliable, validated and in-depth picture of the use of e-book readers in an educational setting. These studies could also throw more light on the differences found in the outcomes, between this study and the wider literature. In addition, a more technical investigation needs to be undertaken, e.g. into the problems found with the display of PDFs and/or distribution of academic journals other than using PDF files, which could enhance the reading experience and put the usefulness found in this study, in a different light. Lastly, as participants expressed a desire to have a lightweight mobile reading device, a similar study into other contemporary mobile technologies such as tablets, could be useful to inform the academic community.

### **6.2.c Use of the theoretical framework**

The theoretical framework has played an important role in structuring the research question, analysing the data and reporting on the result. The activity theory was selected as it was seen appropriate for this study (see p. 23). However, as it states in the model's name, its emphasis focuses on activity. Although this was seen as useful to answer the research question, it indicates a limitation of the research approach of



the study. The framework was useful to structure the exploration of e-book readers in HE, but did not explain or contribute to a wider theory (Babbie, 2007).

Although this study has used activity theory to inform the research questions, the concepts of community and division of labour are not well-developed. Participants had initial objectives for using the reader, e.g., to collaborate and distribute documents with the Amazon e-mail client. However, as these objectives remained in almost all cases hypostatical, they did not result in activities that could be evaluated within the analytical categories, community and division of labour, and were not seen as relevant enough to report on. This shows on the one hand a limitation of this study, as the concepts of community and division of labour are not intensively explored. On the other hand, it shows a characteristic of the e-book reader; that the e-book readers were not used for activities that would involve communication or collaboration. This could be due to the absence of appropriate functionality for this purpose, as the authors of the grey literature argue (e.g. Ganapati, 2009). However, this might not be a prime requirement for a reading device either, as reading and engagement with text is, in first instance, an individual activity. Even if the absence of this functionality was mentioned by the participants, because it limited the choice of other activities they could perform with the device, it was not mentioned in relation to reading for academic purposes. As such, it might be less surprising that the lack of communicative tools on an e-book reader is not a theme in the academic literature, as concluded at the end of the literature review (see p. 19).

Lastly, as we have seen in the literature review, activity theory is a method for evaluation. Applied in the context of education and mobile technology, it is still in development. An important point of discussion is the placement of the concept of

location, the only concept absent in the Engeström's model (1987). Although the model of Wali et al. (2008) was used as a framework for this study, it was argued that the concept 'location' should be seen as part of the concept 'subject' (see p. 28). It was proposed that the subject is situated by its location, and that the outcome of the activity in that location might change, due to modification of the e.g. objectives, habits (rules) and tools available. Although the evidence to support this proposition is largely inconclusive in this study, some evidence to support this argument was found. For instance, participants indicated that they used their time differently while commuting, when they had the e-book reader at hand. Even though constraints in utilising the technology fully were found, the e-book reader allowed participants to, e.g. skim through academic texts, changing the activity's object and outcome in that location from what it would normally have been, e.g. reading the newspaper. However, it was also found that the e-book reader extended the existing objectives and habits of the subject, as the participants also indicated that they read for leisure objectives from the e-book reader, as they used to do while commuting. To conclude, as it can only briefly addressed here, the proposition that the concept 'location' should be seen as part of the concept 'subject' in Engeström's (1987) model, (see Fig. 4), requires more extensive discussion and theoretical exploration of a situated account of the subject, and further research is needed, as this study is not conclusive enough to support it.

#### **6.2.d E-book readers adaptation for educational use**

The e-book reader as a display technology originated as a device designed for leisure, and was not explicitly promoted as a device for use in an education setting. In a sense, it is good to recall a point made earlier by Traxler (2005a) while discussing mobile technology for education; most mobile technology is not designed

for education and “any educational use is likely to involve [by] adaptation, appropriation and compromise[s]” (Traxler, 2005a: 73). Participants in this study found pockets of usefulness in an HE context. Some participants were able to use an e-book reader for a specific purpose by adaptation of individual circumstances and ways of working, but this experience was not shared among other participants. The majority did not find the e-book reader to be a practical tool for marking students’ work, as the notes made on students work could not be exported, and students’ files in PDF were unreadable. However, one participant found a way around this by providing students with a template, and making notes in a separate notebook. Furthermore, most participants found there were constraints when using the e-book reader to skim read, as the reader was slow going backwards and forwards in the text, had poor textual orientation and difficulty displaying of PDF files. However, one participant could work with it, as her eyes could even read the very small font of the PDF, recognised the sections of a journal article quite easily, and she adjusted her reading style to the navigation of the e-book reader. However, for day-to-day use in HE, the e-book reader was not versatile enough to meet most of the participants’ academic reading needs, or, as Kukulska-Hulme (2005b: 48) advises us, the “educational contexts tend to impose new sets of requirements that may not always be met by existing devices and services”. To a large extent, this seems to be true for e-book readers in an academic context too.

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## 8. Appendix

### 8.1. Table of images & table of table's

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## 8.2. Glossary and abbreviations

3G	Third generation of wireless data transmission by e.g. GSM
A4	International standard for paper size
BMP	Digital format for images
DOC	Digital format for Microsoft Word documents
Download	To retrieve a digital copy onto a device from another device or the internet
DRM	Digital Rights Management
DVD players	Device to play DVD disk with video content
E-book	Electronic version of a book, book in digital text
E-book reader	E-book reader is a portable electronic device that displays electronic text using E-ink, see also appendix 8.2.
E-ink	Electronic ink or electronic paper manufactured by E Ink Corporation
E-mail	Electronic mail
E-mail client	Distributor of e-mail
E-text	Text available in a electronic format
EPUB	Electronic format for e-books
Ex Libris	2 <sup>nd</sup> hand books bought from a library
Gb	Gigabyte, indicating the storage capacity for e.g. digital files
GIF	Digital format for images
GPS	Global Positioning System
GSM	Global System for Mobile communication, e.g. 3G network
Handheld	Small pocket size computer e.g. PDA
HDI	Human Device Interaction. Study or design of people interaction with devices.
HE	Higher Education
HTML	Hyper Text Mark-up Language, mark-up language for internet pages or text
ICT	Information Communication Technology
IM	Instant messaging
Internet	Global interconnected computer network
JISC	Joint Information Systems Committee
JPEG	Digital format for images
Laptop	A portable computer for mobile use
Mb	Megabyte, indicating the storage capacity for e.g. digital files
Memory	Capacity to store digital files like e-books, quantified in MB or GB
MIT	Massachusetts Institute of Technology
MP3	Digital compression format for audio
MP3 players	Portable media player that can play MP3 files
MP4 players	Portable media player that can play a variety of media formats
MOBI	Mobipocket Reader, electronic format for e-books
Multimedia	A combination of content in different formats, such as text, quizzes, video and audio
Netbook	Small and lightweight version of a laptop
PDA	Personal Digital Assistant is a mobile device with software that can be used for personal information management or as digital diary
PDF	Portable Document Format is an open standard to store and exchange digital document.
PIM	Personal Information Management. Application software that is used to organise personal information
PNG	Digital format for images

Pocket PC	Handheld-sized computer e.g. PDA
OS	Operating System
RTF	Rich Text Format, document file format
SD	Secure Digital memory cards to store e.g. digital text
Smartphone	Mobile phone with enhanced functionality that is similar to e.g. PDA
SMS	Short Message Service
Stylus	Small pen for writing and directing on a touch screen
Tablet	Mobile computer/media player with a touch screen, mostly larger than a PDA. Generally with a different OS as a Tablet PC
Tablet PC	Similar to a laptop but with a touch screen
Text-to-speech	A functionality that reads-aloud digital text by a computer or other device
Touch screen	Screen that is sensitive to input by touch or stylus
USB	Universal Serial Bus, way to connect devices which each other by a lead
Web browser	Application on computer or mobile device to retrieving information from the internet
Wi-Fi	Devices with Wi-Fi can connect wireless to the Internet
Wireless Access	Ability to access the internet by Wi-Fi

### 8.3. What is an e-book reader?

In this project, we used four different e-book readers: the Sony PRS-505 which first came out in 2008, the Sony PRS-600 which appeared in 2009, the Amazon Kindle (second generation) from 2009, and the Samsung E60 which came out in 2010 (Amazon Kindle, 2010; Samsung E60, 2010; Sony PRS-505, 2010; Sony PRS-600, 2010).

The physical appearance of an e-book reader, for example the Sony PRS-600, can be described as a device roughly the size of half an A4 sheet of paper (around 12 by 18cm), slightly larger than your hand, and as deep as a small paperback book, less than 2 cm deep (Sony PRS-600, 2010). It weighs a little more than 250 grams, more or less similar to a hardback book (Young, 2006). The combination of size and weight makes it very portable, comparable to a single book. It is an electronic device which uses a battery that can be recharged with the help of a computer, or from a regular power socket, using an adaptor.

As a display technology, the most apparent feature is its screen, which is, in all cases, at least 15.2 cm (6 inch), which is on average smaller than a single page of a paperback, and considerably smaller than a page of an average textbook. All e-book readers used in this project have implemented the E-ink technology invented by Massachusetts Institute of Technology Media Laboratory in 2004 (Siegel, 2009; Young, 2006). With the E-ink technology, the screens display “mimics the appearance of ordinary ink on paper” (Siegel, 2009: 9). The screen contains millions of microcapsules filled with black and white powder, which can be steered with an electric charge. As a “positive or negative electric field is applied, corresponding particles move to the top of the microcapsule where they become visible to the user” E-ink (2011). This results in a display of text in black on a gray background, in a resolution similar to that of a normal newspaper (Webb & Naselli, 2007; Young, 2006).

Two of the devices in this project had a so-called ‘touch screen’ that allows interaction with the software using a finger and/or stylus (Samsung E60, 2010; Sony PRS-600, 2010). Another feature of the touch screen is the ability to record hand-written notes. The two other devices in this project, the Sony PRS-505 and Amazon Kindle enable interaction using buttons.

Depending on the type, all devices have several buttons somewhere along the side of the screen or below it. Usually, there are buttons on top to switch it on or off. Most buttons are used to interact with the software, for example selecting a book from the menu, going backwards and forwards in a book, and also there is a home button to go back to the main menu, and also a button for options, such as bookmarking and highlighting. As all devices used in this project had the possibility to play music, they had a button to make the music louder and harder (Amazon Kindle, 2010; Samsung E60, 2010; Sony PRS-505, 2010; Sony PRS-600, 2010). The Amazon Kindle has a small keyboard with all the letters of the alphabet and numbers 1 to 0 for data entry, e.g. note-taking and search (Amazon Kindle, 2010).

The e-book reader is designed to display electronic text, such as novels. All major brands of e-book reader have connections to an online store to sell electronic books, the Amazon Kindle connects to Amazon.co.uk, Sony with Waterstone.com and the Samsung has a partnership with WHSmith.co.uk. For reasons of copy protection and competition, each e-book reader supports digital files with a specific Digital Right Management (DRM), which can only be read on a specific device. The DRM is designed to protect publishers’ copyrights on published work. It also binds owners of a device to buying books from an allocated store such as Amazon. However, all four different devices in this project support one or more open formats. The Portable Document Format (PDF) is supported by all, the Electronic Publication (EPUB) by Sony PRS-505 & 600 and Samsung E60, and Mobipocket Reader (MOBI) by Amazon Kindle. Books in the public domain are freely available in one of these

formats, and can be downloaded easily from, for example, Project Gutenberg ([www.gutenberg.org](http://www.gutenberg.org)). However, e-book readers are also able to display other types of text like research articles, which are most often published in PDF. The Sony PRS-505, PRS-600 and the Amazon Kindle support the display of internet documents (HTML) and Microsoft Word documents (DOC), which expands the types of text which can be read to include manuals, minutes and student essays, for instance (Amazon Kindle, 2010; Sony PRS-505, 2010; Sony PRS-600, 2010). All readers have an inbuilt memory that is capable of storing hundreds of electronic texts. Except for the Amazon Kindle, all readers have one or more external slots for Secure Digital (SD) memory cards, up to 16Gb. Considering that downloading the complete work of William Shakespeare from [gutenberg.org](http://gutenberg.org) in EPUB consumes 2,2 Mb of space, it might be concluded that the extra memory can boost the amount of electronic text on a device to a very extensive library, which can be carried around and read at any time. For all devices, it is possible to store and play audio books or music in the audio compression format, MP3. Furthermore, all devices in this project were able to display photos and images in e.g. JPEG, PNG, (GIF) and BMP format, although these are displayed in black and white (Amazon Kindle, 2010; Samsung E60, 2010; Sony PRS-505, 2010; Sony PRS-600, 2010).

Most contemporary e-book readers have functionalities such as note-taking and highlighting, which is available on all readers in this project except for the Sony PRS-505. The Sony PRS-600 and the Samsung E60 allow drawing of pictures and scribbling of notes with the help of a stylus, which are then stored in, or alongside the documents. The Amazon Kindle and the Samsung E60 come with inbuilt dictionaries to define words instantly. The Amazon Kindle and Samsung E60 are able to read text aloud using the inbuilt text-to-speech software (Amazon Kindle, 2010; Samsung E60, 2010; Sony PRS-505, 2010; Sony PRS-600, 2010).



## 8.4. Categories, models and frameworks on mobile technology

Several authors have proposed models to analyse or categorise educational mobile technologies; although interesting, these do not always offer a sufficient framework for further research in this field.

### 8.4.a. Classification of emerging technology by Kukulska-Hulme & Traxler

(2007)

Based on a review of case studies, Kukulska-Hulme & Traxler (2007) developed a list of categories, in which mobile learning is emerging. Without going into too much detail, they report the following categories (Kukulska-Hulme & Traxler, 2007: 182):

- Technology-driven mobile learning
- Miniature but portable e-learning
- Connected classroom learning
- Informal, personalised situated mobile learning
- Mobile training/performance support
- Remote/rural/development mobile learning

The different categories give an overview of the different areas mobile technology used, and research on mobile learning which is active. The categories give a notion of the location, social environment and type of technology. However, on closer examination, the categories are not clearly distinguishable, and case studies such as those by Huang et al. (2008), and van Ooijen & Broekema (2010), who developed an ARS on a PDA/smartphone, could be regarded as technology-driven, as well as being a connected classroom development. Furthermore, the categories do not give much of a lead for further research, and as such, the categories offer an interesting overview of the different directions which mobile technology can take, but are not suitable for a research study.

### 8.4.b. Classification of Mobile Technology by Naismith et al. (2004)

In their literature review for NESTA Futurelab, Naismith et al. (2004) classify mobile technologies based on their degree of portability and personalisation, which is helpful to position the different mobile technologies available for learning.

Naismith et al. (2004: 7) define the different mobile technologies along two axes (see Fig. 6). One axis defines the mobility, or portability of the mobile technology, between the dimensions *Portable* and *Static*, ranging from the most portable/small devices such as a mobile phone, to fixed objects that cannot be moved such as an electronic white board in a classroom. The other axis defines the degree of ownership of a device, between the dimension *Personal* and *Shared*, ranging from one end to the other, i.e. full ownership of the technology, or a shared technology.

Although Naismith et al.'s. (2004) attempt to categorise mobile technologies in a wider group of educational technologies is interesting, as it put mobile technologies in a wider context and allows certain comparisons to be made, it could be argued that due the way the axes are defined, only technologies in quadrant 1 can seen as mobile technologies. For example, electronic whiteboards, kiosks, and to a certain extent audience response systems are fixed technologies, and are not portable in the same way as mobile phones.

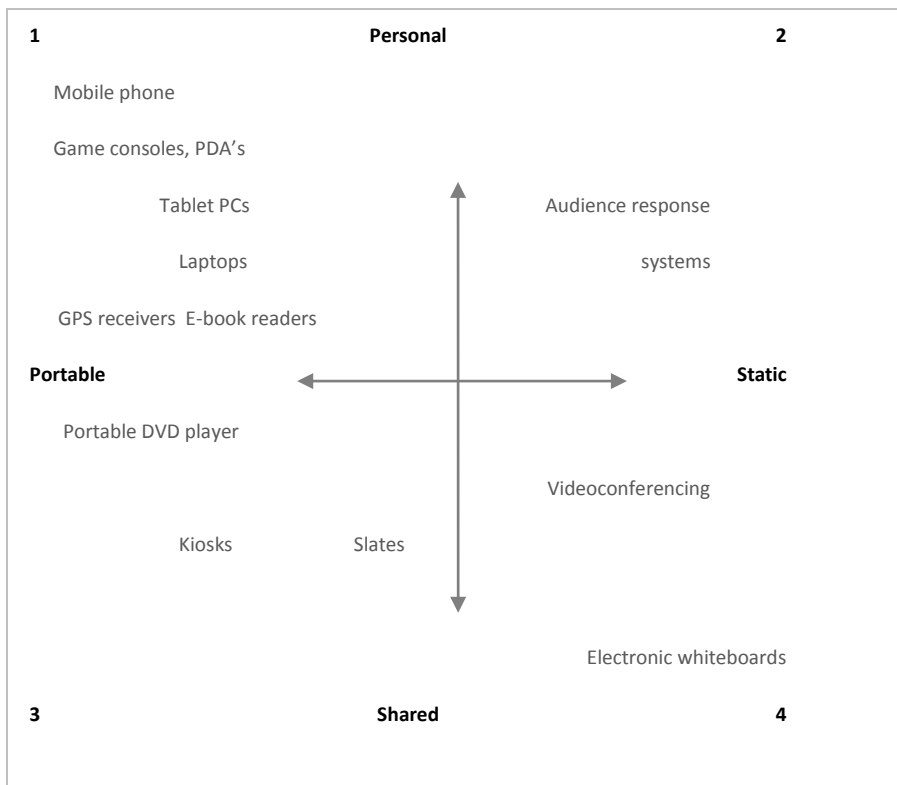


Fig. 6 Based on Naismith, et al. (2004: 7), Classification of Mobile Technology

The classification of mobile technologies on the scales, *Portable – Static* and *Personal – Shared*, by Naismith et al. (2004), is useful to catalogue different technologies for education in general, and show their relationships with each other. However, it offers less guidance for further research on the use and usefulness of an individual device.

#### 8.4.c. Functional Framework by Patten et al. (2006)

Patten et al. (2006) proposed a Functional Framework of Pedagogical Underpinnings to investigate the device functionality and the different learning theories. Although the framework is mainly based on the functionality of a PDA, by grouping the different applications of PDAs, Patten et al. (2006) came up with the following categories of applications:

- Administrative application
- Reference application
- Interactive application
- Data Collection applications
- Location awareness application
- Collaborative application
- Microworld applications

After setting out the inventory of applications, Patten et al. (2006) go one-step further by linking the functional applications of mobile devices to the learning theories in their 'Functional Framework Pedagogical Underpinnings', and map the pedagogy that potentially could be mediated with the mobile technology, see Fig. 7. Some functionality only enables a single pedagogical approach; other functionalities support different forms of pedagogies. The labelling however does not always seem consistent, the well-known learning theories such as behaviourism, cognitivism and constructivism are represented, however less clear is what little pedagogy and instructional mean.

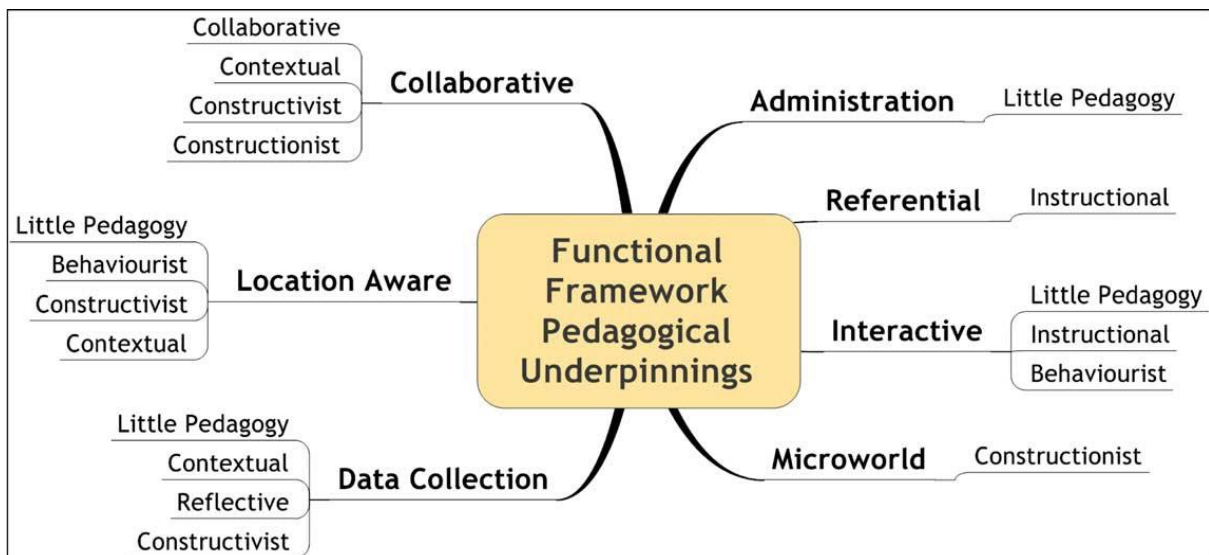


Fig. 7 Functional Framework Pedagogical Underpinnings, Patten et al. (2006: 300)

Putting the framework into practice, Clough et al. (2007) investigate the use of PDAs and smart phones for informal learning among employees of three businesses, by circulating a questionnaire. Clough et al. (2007) found the framework was helpful for classifying the responses, and they also found that almost all functionalities were used for informal learning, except for the category 'microworld', as simulation was not considered as relevant.

Framing the potential of a mobile device based on its functionality and applications, related to the underlining pedagogical theories is helpful, and as Clough et al. (2007) show, the framework can be used for further research. However, the 'functionality framework pedagogical underpinnings' is strongly based on the functionalities of smart phones and PDAs, and is not applicable without consideration, to other technologies. Furthermore, it could be argued that because it refers so strongly to the PDA, the framework has a temporary validity, as new devices will offer new functionalities and connectivity. Lastly, Patten et al.'s (2006) framework has a strong focus on functionality, and pays no attention to the context in which the technology is deployed.

#### 8.4.d. Classification of mobile learning by Frohberg (2008)

Frohberg (2008) developed a classification for mobile learning based on context. The "classification consists of four categories: independent, formalized, physical and socialising" (Frohberg et al., 2009: 313), see Fig. 8.

Frohberg (2008) plots the learning context against a degree of 'pedagogical ambition'. It can be seen that the socializing context has the highest pedagogical ambition and the independent context is regarded to have the lowest. Drill and practice activities in the 'independent context' are related to a behaviouristic learning theory and a low pedagogic ambition, and the 'socialising context' to a high pedagogical ambition by its elaborated use of communication, which is related to the constructivist learning theory. The degree of pedagogical ambition from low to high, implicitly assumes a qualitative hierarchy in the pedagogy and learning theories, whereas the different theories might need to be seen as different pedagogical approaches that make different assumptions about the process of learning (Mayes & de Freitas, 2007). As such, a degree of pedagogical ambition might not be an appropriate scale to distinguish between different pedagogical approaches.

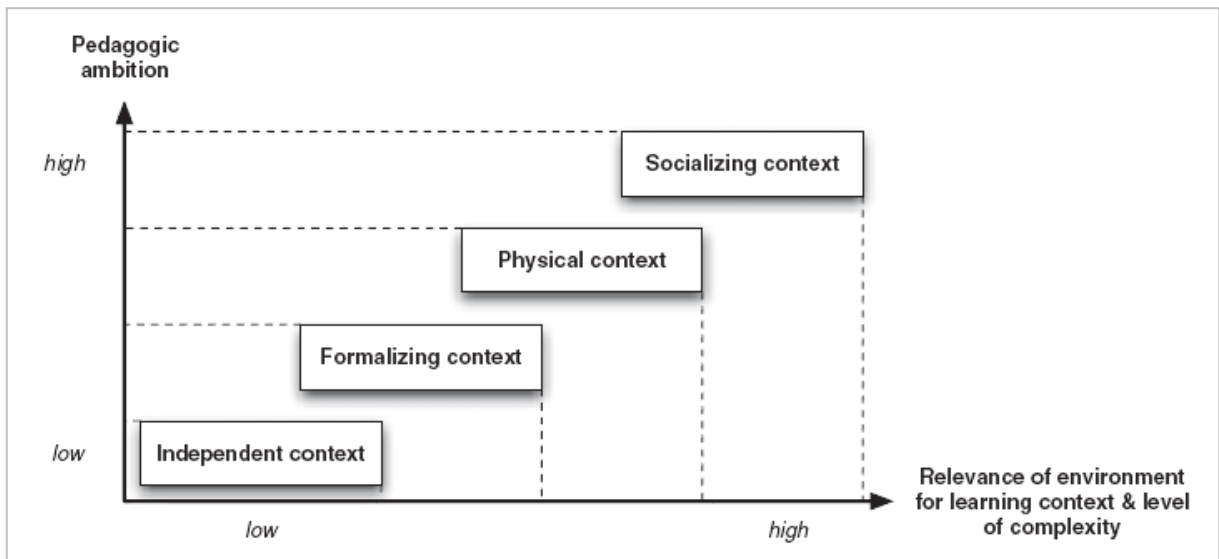


Fig. 8 Frohberg et al. (2009: 313) Classification of mobile learning by the factor 'context'

However, based on a literature review Frohberg et al. (2009: 314) were able to classify 102 mobile learning projects, and concluded that most projects took place in the 'independent context' (n32), 'formalized context' (n27) and 'physical context' (n38); only 5 projects could be categorised under the 'socialising context'.

Although we might question the relevance of the level of the pedagogical ambition, the context in which the mobile technology is used will be useful to investigate the different learning environments of e-book readers. However, it might be argued that the physical location is an independent element and separable from the social context or formality of a learning situation. An 'independent context' might have a formal or informal character. Furthermore, learning activities in 'physical location' might take place alone or in a group, formal or informal. It might be more useful to differentiate between a location (e.g. independent, classroom, and physical), a social setting (e.g. isolated, tight groups, community) and learning context (e.g. formal, informal). As such, the categories from the physical location are distinguished enough, although the notion of the physical location is worth investigating.

## 8.5. Interview guide

### Exploring the usefulness of e-book readers in HE

Questions	Activity theory	Time 60 min
<p>Introduction</p> <p>Thank you for participating in this interview.</p> <p>Which device did you use?</p> <p>For how long</p>		5
<p>-What was your motivation to participate in this study?</p> <p>-What were your initial expectations</p> <p>-How did you think you might use it?</p>	Object	5
<p>-For what kind of activities did you use the e-book reader?</p> <p>-Did it change the way you read, worked or did it change your routine?</p> <p>-What would you normally have done instead?</p> <p>-In which way was the e-book reader helpful for the activities?</p> <p>-Professional use or of for leisure?</p> <p>-How did you use the e-book reader, or which functionality did you use?</p>	Tools Rules Division of labour	10
<p>-Which activities were you not able to do?</p> <p>-For what reason.</p> <p>-What have you done instead?</p> <p>-Did you use other technology or tools to achieve this?</p>	Tools Rules Division of labour	10
<p>-In which situations did you use an e-book reader</p> <p>-Where?</p> <p>-With whom?</p> <p>-Why?</p>	Location Community	5
<p>-Now that you return the e-book reader what will you not be able to do anymore?</p> <p>-Will you buy one? Why?</p> <p>-Will you recommend one to a colleague? Why?</p>	Object Tools Rules Community	10
<p>Is there anything that surprised you about the e-book readers?</p> <p>-Could you do things you were not expecting?</p> <p>-Not able to do things you were expecting to be able to do.</p> <p>-Do you see the change in practice continued beyond this project?</p>	Object Tools Rules Division of labour	10
<p>Closing</p> <p>-Is there anything else you would like to discuss.</p> <p>-Thank you very much for participating in this interview.</p> <p>-We will keep you informed about if the results are published in one or the other form.</p>		5

## 8.6. ADC newsletter item

### Call for volunteers to participate to investigate the usability of e-book readers

The Academic Development Centre is looking for academics that would like trial different types of e-book readers and share their experience with us during this academic year. It will be an opportunity to experience different types of hardware, including the Sony e-reader, Kindle and Apple iPad, and explore their potential in learning and teaching, administration and research.

E-book readers share some of their development with other portable devices such as laptops. In the early 1990's it became possible to read electronic text away from the desk. Other multipurpose devices such as the personal digital assistant (PDA) followed, making it possible to read digital texts on smaller, more portable devices (Herther, 2008). However, the reading experience was poor, mainly because of hardware limitations including screen size, poor resolution, limited battery life and the lack of additional features such as note-taking and highlighting (Herther, 2008). Although screen size and resolution improved, it took until 2006 before a new technology, 'electronic ink' (E-ink), became incorporated in almost all e-book readers (Webb & Naselli, 2007; Siegel, 2009). E-ink screens have many advantages over normal computer monitors as a "display technology designed to mimic the appearance of ordinary ink on paper" (Siegel, 2009: 9). Some of the more recent innovations include a wider range of functions such as inbuilt dictionaries, text to speech software and wireless and 3G connections to the internet (Amazon, 2010; Samsung, 2010; Sony, 2010). E-book readers are primarily single-purpose devices in contrast to increasingly sophisticated multi-purpose mobile devices such as smart phones, often providing some e-book functionality. The latest example, the Apple iPad was introduced in January 2010, and is, amongst other devices, promoted as a reading device that could compete with a dedicated e-book reader (Arthur, 2010; Reuters, 2010).

Although, sales of e-books on Amazon overtook those of printed books during December 2009 (Allen, 2009), and the popularity of e-book readers in the leisure market is apparent, constraints for a rapid development of e-book readers in the Higher Education sector are numerous. Firstly, different models and software among publishers for 'borrowing and sharing', digital rights management (DRM), pricing models, high cost of devices and readers, reading platforms and formats make use complicated. Secondly, different software platforms limit the possibilities for personalisation and 'borrowing' models and digital rights management limits accessibility (Chems, 2006: 28-9).

Few studies have explored portable reading devices in education and those that have, offer mixed results. They indicate benefits relating to portability (Janssens & Martin, 2009; Waycott & Kukulska-Hulme, 2003), as well as environmental benefits (Young, 2009). However, the studies identified constraints on interaction and functionality such as highlighting, note-taking and access (Janssens & Martin, 2009; Sheih, 2009; Waycott & Kukulska-Hulme, 2003).

In the grey literature, a couple of recurring themes can be found. E-book readers are often pictured as the next technological step after paper books (BBC Newsnight, 2009). Benefits are seen in their portability, which allows teachers and students to store and organise all their textbooks, documents and research papers in one location (Gustafsson, 2009b). Other potential benefits can be summarised as the potential for reducing the cost of learning materials, as well as reducing environmental impact through using less paper (BBC, 2008; Gustafsson, 2009a). Devices with larger screens like the Kindle II are expected to suit academic purposes more fully, as they include graphs and tables (Harris, 2008). However, other authors see multi-purpose devices as having more long-term potential, and that e-readers will need to support multi-media and have web connectivity to be useful in education (Bilton, 2010; Ganapati, 2009; Lardinois, 2009; Stahmer, 2009).

However, it remains to be seen whether digital learning materials will be cheaper than traditional materials. Furthermore, the environmental benefits of saving paper and print may not exceed the costs in terms of resources and energy required to build and maintain a reader in its potentially short economical life.

Moreover, it has to be seen if e-books readers are a natural development over paper books. The design of E-book readers' mirror paper books and have integrated substitutes for e.g. highlighting and bookmarking. This is more imitation than innovation and might be sufficient only for use for leisure purposes. It comes as no surprise that academic studies found the technology to be constraining rather than liberating, as reading for study requires more developed practice and individualised ways of engaging with texts than reading for leisure. Although single-purpose devices might have the benefits in terms of readability by E-ink, accessibility and portability, limited interconnectivity to the web as well as partial multi-media support might be a hindrance in education. The user may be required to carry multiple devices, and care would need to be given to both issues of exclusion for individuals that do not have access to the technology and to accessibility. The relationship between the functionality of e-book readers and the potential individualised engagement with the written word is unexplored in the literature and as such is central to this study along with the issue of the specialist single purpose device versus a possibly less optimum but more flexible multipurpose device.

For more information on the project, or to express an interest to participate, please contact Hendrik van der Sluis.

Hendrik van der Sluis  
Tim Linsey

## 8.7. Baseline questionnaire

### Please indicate your age

17 and younger
18-24
25-34
35-44
45-54
55-65
66 and over

### Position

How would you describe your position at the university?

Student
Academic support staff/administrator
Lecturer
Researcher
Management
Other (please specify)

Please specify your faculty

--



## 8.8. Participants' information sheet

**Study:** Exploring the usefulness of e-book readers in HE (Working Title)

Dear Participant,

We are asking you if you would help us with a study, which will explore the possible usefulness of e-book readers for academic staff and their work in Higher Education.

If you agree, we would ask you to trial one or more different e-book readers, each readers would be tested by you over the period of three to four weeks. You will be ask to participate in an interview to capture your experience and opinion on e-book readers for a higher educational setting.

You do not need to take part in this study, and you can leave it at any time without affecting your education/relationship with the faculty or Kingston University in any way.

There are no immediate or expected risks for participating in this study.

All information we gain from you will be maintained in a strictly confidential manner. The only people who will have access to the raw data will be, Dr. Tim Linsey and Hendrik van der Sluis. After the project, all raw data that can identify individuals will be destroyed.

The data and outcome of this study may be used in research contexts - e.g. for analysis, for submission as an assessed piece of work and for presentations at conferences or publication in academic journals. In the reporting of the project, no information will be released which will enable the reader to identify who the respondent was. It is the researchers aim to release at least a small report at the end of this academic year, which will be disseminated internally.

Participants who have agreed to take part in the study will be given a consent form to sign, give permission to record and store the questionnaires and interview, and agree that the data obtained is used for research purposes.

We will not able reimburse expenses or other cost related to this project and participants agree to take responsibility and liability for the devices they loan during this project.

If you have any questions or problems, please contact me.  
My e-mail address is H.vanderSluis@Kingston.ac.uk.

Yours sincerely,

Hendrik van der Sluis

## 8.9. Written Consent to participate in a research study

**Study:** Exploring the usefulness of e-book readers in HE (Working Title)

Statement by participant

- I confirm that I have read and understood the information sheet/letter of invitation for this study. I have been informed of the purpose, risks, and benefits of taking part.
- I understand what my involvement will entail and any questions have been answered to my satisfaction.
- I understand that my participation is entirely voluntary, and that I can withdraw at any time without prejudice.
- I understand that all information obtained will be confidential.
- I agree that research data gathered for the study may be published provided that I cannot be identified as a subject.
- Contact information has been provided should I wish to seek further information from the investigator at any time for purposes of clarification.

Name of Participant

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Participant's Signature

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Date

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Statement by investigator

- I have explained this project and the implications of participation in it to this participant without bias and I believe that the consent is informed and that he/she understands the implications of participation.

Name of investigator: Hendrik van der Sluis

Signature of investigator

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Date

## 8.10. Transcribed and coded interview with VQS

VQS 1	<b>OK VQS. Thanks for agreeing to this interview. I have got some questions prepared but they are more guidelines than real questions; there are some topics I would like to explore, but let's start with the things you use it for. When I left the reader with you, you own a Kindle isn't it?</b>	Object
VQS 2	That's right, yeah.	
VQS 3	<b>So you own a Kindle. Was it the DX or the normal version?</b>	
VQS 4	Just the normal version.	
VQS 5	<b>So you own a Kindle and you have tried the Sony PRS600 for a while, and your main aim was to read journal articles on it and maybe use it to mark students' work and to see if it's any good for your [] students who are in a distance learning situation, is that correct?</b>	
VQS 6	Yes, yes, or we'd like to use it for the distance learning students if we can, yeah.	Object
VQS 7	<b>Is there anything else you did try or export?</b>	
VQS 8	No, they were the three main ones, yeah.	
VQS 9	<b>OK, well maybe we can move to the second question: how did you use it and how was it, how was your experience? And feel free to compare the Kindle with the Sony if necessary.</b>	
VQS 10	Yeah. I guess physically the quality of the Sony is very good. It feels good to use and it looks good. The Kindle is... well it's plastic in comparison but it doesn't feel... well it feels solid enough so I don't have any problems in using it, but the Sony is definitely a nicer piece of equipment in that sense.	Tools, HDI, Sony-Kindle
VQS 11	So being able to get content onto it easily and particularly being able to read PDFs on it easily are key aspects of it.	Tools
VQS 12	<b>That's because most of your academic material is on pdf?</b>	
VQS 13	Well in terms of the research articles, they will all be pdfs. In terms of the work that students submit, I always get them to submit pdfs anyway, so they needed to be pdfs. And then it was how well you could use them to read on screen and given that the screen is the biggest limiting factor in terms of size, which in part is why it would be interesting to look at a Kindle DX to see how the size difference makes it easier to read, both the Kindle and the Sony allow you to rotate the displays which is important because the pdfs will almost always be formatted to A4 size, and doing them in portrait view, the text will just be too small, so they need to be rotatable into landscape and then scrolling up and down just between views on it.	Object, Tools, Reading experience, PDF
VQS 14	Both of them allow you to add notes to them, the Kindle via the keyboard which is a bit painful to use and you wouldn't want to write much from it. The Sony with the on-screen stylus, and whilst that's useful for yourself if you're making notes, how you'd fill it with a group of students would remain to be seen because somehow you have to get them those comments.	Tools, landscape, stylus
VQS	So my tendency in the end was to actually write them down on a piece of	

15	paper.	
VQS 16	<b>OK, so you didn't really use it...?</b>	
VQS 17	And typed it up later, yeah, just because it seemed the easiest thing to do. Perhaps the biggest frustration though was with the Sony in that trying to get it to zoom to a level that maximised the width of the screen was almost impossible to do. The Kindle, as a result, was just a lot easier to read and use for the pdfs, so that was quite disappointing for the Sony.	Tools, reading experience, formatting
VQS 18	And given that everything I have is a pdf and most of it is A4 formatted, it ... that was probably the biggest usability disadvantage. I far preferred the Kindle just because it formatted the page better.	Tools, reading experience, formatting
VQS 19	<b>Oh that's interesting because other participants, although not everybody had the availability of a Kindle and a Sony, but some who had because they were more or less in a similar position, they said 'Well actually the zooming on the Kindle breaks more or less all the sentences in half and you have to move forward and backward all the time to see it.'</b>	
VQS 20	Yeah.	
VQS 21	<b>While the Sony at least tries to get the sentence as a whole, although disjoint, as whole on the page, so that's an interesting one.</b>	
VQS 22	Yeah, and actually what I've found is that on a standard A4 page, if it's type-setted 12 point, the way the Kindle shows it on the screen, I can view the entire width of the page and read it reasonably comfortably, I didn't actually have to zoom in.	Tools, reading experience, PDF columns
VQS 23	With the Sony reader, it didn't format it very well to fill up the full width, so I had to zoom in and then scroll around, but you're right, it is better at scrolling around and the one place where the Kindle doesn't work is if you've got multi-column papers which you get fairly regularly in some journal articles, and then yeah, it splits it down the middle and then you have to scroll backwards and forwards which is not very helpful.	Tools, reading experience, PDF columns
VQS 24	The other thing I did look at doing though was... or I set up a template in Word specifically designed for the Kindle, so that I could read text in portrait format, and I tried that and that's actually quite nice to use, so I think I will trial that with students possibly this semester so that they submit a format design for the Kindle, and in fact for the Sony for that matter, so that you can read it on the screen.	Tools, reading experience, Template
VQS 25	<b>So they use the templates, fill it with their text for the assignment/assessment?</b>	<b>Object, template, assignments</b>
VQS 26	Yeah.	
VQS 27	<b>And they will then format it through the pdf themselves?</b>	
VQS 28	Yeah.	
VQS 29	<b>And send it back to you?</b>	
VQS 30	Yeah. The only issue that I can foresee is where they've got graphics, because obviously the page size is going to be quite a lot smaller than an A4	Tools, template,

	page, so I think I'll just get several students to try it first and see what they experience in doing it that way.	images
VQS 31	<b>So you nevertheless will continue using the Kindle?</b>	
VQS 32	Yes, yeah, certainly for marking from. Like I say 12 point in A4 works OK in landscape mode which makes it very quick to scroll through and mark. You also mentioned initially that the screen, because of the resistive screen in the Sony, you've got that extra layer and it certainly reduces the crispness in comparison. The Kindle is definitely a better reading experience. But yeah, you just lose some of that crispness and brightness from the display.	Tools, e-ink, touch screen, Reading experience. Kindle-Sony, see: WHS 119
VQS 33	For marking, colour would certainly be useful and obviously neither of them have colour, although colour ebook readers are on the market now, so that would be nice to have for marking certainly some things.	Tools, colour,
VQS 34	<b>But would it change your convention in the way you mark now? I mean how do students now deliver their work? They print it off?</b>	
VQS 35	No, no, it's entirely pdf online. I used to mark on a laptop anyway.	Tools, rules, marking, see: NUS 106
VQS 36	<b>Yeah, and how do you deliver then your comments? Do you embed them in the pdf?</b>	
VQS 37	My tendency is to give them a written paragraph about the essay, and then to ... for the on-site modules they get offered face-to-face comments. For the distance learning students, what I have been using is recorded comments as MP3s and then send them back to the students.	Tools, rules, marking
VQS 38	<b>And how does this division of [labour] then change by the use of the reader?</b>	
VQS 39	Well, with the reader I can do it anywhere which is quite helpful. Yeah, rather than just being tied to a computer wherever that may be.	Object, tools, location.
VQS 40	<b>But how do you make then the notes and the comments you want to deliver in a face-to-face? Do you store them in the reader, or do you then take them...?</b>	
VQS 41	No, sorry, I'll write those down and that actually gets put into a spreadsheet so all the comments are stored there, and those comments are then loaded by up into StudySpace.	Tools, rules, marking
VQS 42	<b>OK. Did you really use the reader for example during your travel, mark some students' work on the train or something?</b>	
VQS 43	Yeah, yeah, I did.	
VQS 44	<b>Could you indicate where and how? (Except for the train or with the train – where did you use the Kindle to mark)?</b>	
VQS 45	Oh right, well. Yeah, on the train to and from work or ... Quite often actually if I was working at home, I would work somewhere else other than the study and then take the e-book reader with me to do it. Yeah.	Location, tools,
VQS 46	<b>What was the main reason for doing that? I mean you've got it also on the screen.</b>	
VQS 47	Yeah, no, I found changing the environment easier to work to, and perhaps, I guess, working at a desktop you end up getting distracted by things like email coming in, so I found I was probably more focused in just working on the marking. And the thing about... that the thing that I find when I'm marking, is that because they're discreet units, if I know I've got 10 minutes or half an	Location, tools, efficiency.

	hour of clear time, I can just mark 5/10 pieces of coursework in that time and then put it down and come back to it later. So I find it's quite a good thing to do when I've got a set amount of time that I know is going to be free which is why it's quite useful for the train as well.	
VQS 48	<b>So in a way it's also quite an effective way of using your time?</b>	
VQS 49	Time, yeah, very flexible. The other nice thing about the Kindle is the wifi on it, which of course Sony doesn't have at all, which makes it very easy to send documents to it.	Rules, Tools, connectivity sending documents,
VQS 50	Normally if I had a whole class's set of stuff to mark, work to mark, I would download it from StudySpace and then just do it via the USB connection, but if there was an individual document, you can just email it to yourself and then the next time the wifi connects... which is quite useful.	Rules, Tools, connectivity sending documents
VQS 51	And then of course because it's got wifi there's a web browser in it which is surprisingly usable. It's nowhere near as usable as a desktop PC, but it works surprisingly well.	Tools, internet, See: QTS 97, see:
VQS 52	<b>But you're using the wifi with your own home connection?</b>	
VQS 53	I tethered it to my mobile phone as well and it worked fine.	
VQS 54	<b>OK because another participant was actually using the 3G version of the Kindle and he was really frustrated with this. I mean aside from the display, it also took ages to load an individual website so that wasn't really a...</b>	
VQS 55	Really? Oh I didn't think that was the case. I don't know whether it was... because it uses Amazon's whispernet which they piggy back... they must have a purchase time, so I tethered it to the wifi hotspot on my phone and I found it worked quite quickly actually. I logged in and checked my email here actually just to see if it would work and it did, fine.	Tools, internet, connectivity
VQS 56	<b>So maybe it's because of the wifi connections, maybe the 3Gs may be a little bit more ??.</b>	
VQS 57	It could be, yeah. So I've used it at home over the wifi as well, but tethering it to the phone worked quite well.	
VQS 58	<b>OK. Coming back to the journal articles and your more professional interest, so this was the students, how was your experience with reading for your academic purposes?</b>	
VQS 59	Yeah, again it's ... I mean that's quite useful. I always have a list of things that I should have read, and again, if I know I've got a bit of time on the train, it's quite useful just to be able to have those at hand, so that I can just call up an article I've been meaning to read and just start flipping through it.	Object, Location, efficiency, flipping through, see GQP 55
VQS 60	So the ability to have 100 articles there and I can just pick out the one I'm interested in reading is handy.	
VQS 61	<b>OK. How is that organised? I mean I've seen situations where if you transfer your pdf files, all the names can screw up and it's quite difficult to organise this one.</b>	
VQS	Yeah. Well I didn't find that with the Kindle. I mean the Kindle is quite	Tools, Rules,

62	irritating in its ... it doesn't tag things very well at all. The simplest option for me which I'm amazed they don't support is in the documents folder, to have subfolders which essentially replicate when you start navigating your document, but it doesn't do that on a Kindle and that's something I know that's been requested by lots of people. So yeah, I hope with that phone ware update, that that will be added in the future.	document structure. See: QGS 129, TCS 99, NUS 184
VQS 63	<b>And how did you find your way around it now for the time being?</b>	
VQS 64	Around?	
VQS 65	<b>Well around the organisation or...?</b>	
VQS 66	Well at the moment I've just dumped a series of documents in there that I'm reading and then when I've finished, I'll just delete them off it. So the organisation could be a lot better on the Kindle than it currently is, I guess because pdf support is relatively new on the Kindle and the device is far more set up to purchasing books, I think it's got a little way to go yet before it's good for handling a variety of different types of documents.	Tools, rules, PDF.
VQS 67	I'm not the sort of person that will stick absolutely everything on it though, I'll generally stick on the stuff I'm working on and when I've finished I'll just remove it.	Rules
VQS 68	I have managed to crack the screen of the Kindle as well, so they are far more delicate. It's funny actually when you watch the Kindle advert on television because none of them have covers on and they're using them by the swimming pool and they're cycling with them, and yes, I think the first purchase anyone would do would be a leather cover for them because the screen is quite robust but you've only got to twist the frame or have something sharp against the screen and it will go pop.	Rules, tools, HDI, Kindle, robustness
VQS 69	<b>Reading on it, how was your reading experience in comparison to normal paper? To give you an example, some participants are saying 'Well if I read for academic purposes, then I've got my articles, but I maybe only want to deep read a couple of them and the rest I want to [screen]. How does that work, how does it fit into your academic...?</b>	
VQS 70	Uh... it's probably not quite as flexible as paper. Certain paper you can flick through it very quickly, you can go to the end, read the conclusions and then you might want to look at a figure and then a table and then go back to the beginning, so all those kinds of things take far longer electronically.	Rules, Tools, Reading experience, flipping, structure see: GQP 103
VQS 71	So whereas with a novel it is entirely linear, so you just read it through from start to finish, as soon as you start working with a text book or a paper it's not, and they have got navigation tools to go to certain pages, but it's, yeah, just slower to do and I just accept that as one of the downsides.	Rules, Tools, Reading experience, linear reading, see: WHS 109, QGS 12
VQS 72	<b>But it is not enough, or it is not such a downside that you won't use them anymore?</b>	
VQS 73	No, not at all, no.	
VQS	<b>What is compensating for it?</b>	

74		
VQS 75	Well the fact that I can have 50 articles on there, the fact that I can search it which is quite... immensely useful and I don't have to print things and carry them around.	Rules, Object, location, carrying around. See: NUS 9
VQS 76	<b>Do you make notes on your papers and...?</b>	
VQS 77	If I've printed something out, I quite often do actually, but they're usually temporary notes. What I like to do is then try and scribe that into actions of some sort, or make a permanent note somewhere else. So if I print out a paper, they'll usually get thrown away at some point.	Rules, note-taking, see: TCS 113
VQS 78	<b>So that's maybe part of the reason that your current routine is easily reproduced in the Kindle because you're... it's disposable anyway.</b>	<b>Rules, disposable text</b>
VQS 79	Yes.	
VQS 80	<b>So in a way, because it's disposable the Kindle... it's not that much of an obstruction that you can't highlight or take notes?</b>	
VQS 81	No, no. And of course one of the facilities on the Kindle is obviously make your own comments but also look at other people's comments, and it doesn't particularly interest me for novels, but it would be interesting for textbooks. I haven't bought a textbook but it would be interesting to see how many textbooks have been annotated by other people and look at some of those comments. They could be quite useful for students.	Tools, other technology, Sharing notes/annotations, Kindle. See: BTP 49
VQS 82	<b>And would it give them extra over their own comments?</b>	
VQS 83	Well I think you'll find in every textbook there's areas where people perhaps don't quite understand or there's some information that's either out-of-date or needs updating, and having user comments could be quite useful in those situations.	Tools, Community, other technology, Sharing notes/annotations, Kindle.
VQS 84	<b>OK. So that would refer to a kind of community of practice?</b>	
VQS 85	Yes it would, yeah.	
VQS 86	<b>Isn't that a downside, that maybe every unknowledgeable students would leave comments?</b>	
VQS 87	Well it becomes a kind of a wikipedia type effect then doesn't it? So I don't know if user comments are... I don't think they are refereed in any way but it would be interesting you see what it was like. I can see some benefits but yes, you could end up with lots of comments of which very few of them are particularly useful.	Community, sharing notes/annotations
VQS 88	<b>If you could select for example, select the people who leave comments in your community of practice, would that help?</b>	
VQS 89	Yeah I think so. I was wondering if you could do something like that internally so you could just tell other students on the course or yeah, within your community you could have other academics or faculty members, so yeah, a	Community, sharing notes/annotati



	bit more flexibility and that would be quite interesting.	ons
VQS 90	And if it was a publisher's textbook, whether they could actually have that as a value added service where they essentially referee those comments and add them into the e-version.	Community, sharing notes/annotations
VQS 91	<b>Yeah. I can imagine that for... especially for distance you would have something extra because you're not that far away any more if it comes to reading the textbook in a way. OK.</b>	
VQS 92	<b>That's a service that Sony doesn't have, this integration with other technologies and you mentioned that you've got the Kindle application on your phone, is that true?</b>	<b>Sony-Kindle</b>
VQS 93	Yes.	
VQS 94	<b>Would you mind exploring this Kindle aspect, having the Kindle service and buying books, purchasing books from a Kindle ??, but then also be able to read it on your screen or your computer or ?? because we haven't recorded that, so that's ??</b>	
VQS 95	Yeah, I had a play with the Kindle Application on my phone as well and I didn't find it was a particularly good experience. I mean the screens are just so small so you can read stuff, but I wouldn't choose to read a book on a ?? [21:41] screen.	Tools, relations with other tech.
VQS 96	I mean the clever aspect is that it synchronises both the books you've purchased and where you are reading them across all your devices, including desktop, phone, Kindle, which is quite clever. How useful it is I guess remains to be seen.	Tools, relations with other tech.
VQS 97	Although certainly the desktop application I could potentially see as being useful, being able to synchronise between your desktop and the Kindle for students in terms of things like textbooks and materials that they might have, it could be quite good.	Tools, relations with other tech. See: WHS 45
VQS 98	<b>What would be the benefit of them?</b>	
VQS 99	Well I guess that they're at their PC far more, so that if they're maybe doing a practical and want the textbook open at the same time, or look at some comments related to that, I guess you're using the Kindle for reading, but your desktop is going to remain your main conduit for the work you're doing. So being able to combine those in some way – it will be interesting to see how they got on using them, yeah.	Tools, relations with other tech. See: WHS 45, Rules, single-multi
VQS 100	<b>OK. Reading is just one aspect of your work. I mean you need to read quite a lot, you need to mark students' work ??, and you read quite a lot of academic work for example, academic papers, but partly all this reading is very closely related to writing as well, so how does the Kindle fit into this kind of practice?</b>	
VQS 101	I've never really thought of it in that way at all. Yeah, I haven't really thought of it that way, so...	
VQS 102	<b>I mean one of the things you do was you take notes, paper notes in a paper notebook and then you transfer them to your computer and send them away to your students for example, how does that relationship with academic work... you are writing quite a lot of papers, well at least that's something I saw on your reference list.</b>	
VQS	Yeah, I mean I guess I will make notes from papers which strike me as	Rules,

103	interesting, and papers that are useful get entered in note so that I can come back to them and they'll be tagged with words, so ... yeah, for me the desktop remains the core area and interesting information is I record and store the project I'm working on and the paper will go into ?? [24:34] so that I've got a record of it, the citation for it.	Reading & Writing, single-multi, PC
VQS 104	<b>OK. If you read an article on your Kindle, you actually can read it ?? using for example for an article, do you then separately print this individual article?</b>	
VQS 105	Well, if it's worth keeping I'll store it on my hard drive, and I tend to know the articles by the author and the year and subject, and because they're all pdfs in the directory I can also search for keywords in them as well.	Tools, PDF, organisation, see: GQP 76, VQS 181
VQS 106	<b>OK, so in a way if you write an article, in your case you hardly print anything.</b>	
VQS 107	No.	
VQS 108	<b>So you are digitally much more...?</b>	
VQS 109	Yeah, almost entirely. Yeah, it's only if... if there is a particularly important paper or a paper that has a lot of content that is important, I will tend to print it out because I'll be annotating it quite heavily, so I will do that paper-based. But yeah, 99% of what I will do will be a digital ...	Rules, Tools, annotation, Writing
VQS 110	<b>OK, so in a way you don't [bring] papers to read more deeply, only if it's a real... well, heavy content related?</b>	
VQS 111	Heavy content, yeah.	
VQS 112	<b>OK. Because that's one of the things other participants mentioned in their practice, because if they are writing, a lot of papers are... they are surrounded by papers where they easily skim read, flick through them; with the Kindle or the Kindle e-book reader, they didn't really fit into this practice because it was too....</b>	Rules, Reading experience, skim reading
VQS 113	I can see what you mean there, yeah, and I wouldn't use it for that. For me, the Kindle gives me an opportunity to make use of those... that half an hour or an hour where it would be good to read and it allows me to access that content. So I will tend... when I'm writing a paper, instead of spreading them around, I'll have them on the computer and it will just bring up pdf.	Location, Rules, computer, habits, efficiency, see: NUS 174
VQS 114	<b>Yeah, and you can flick through?</b>	
VQS 115	Yeah, and the ability to search is the key aspect of it.	
VQS 116	<b>OK. Can we explore a little bit your flexibility of the Kindle gives you time and space? You use it on the train, is there any other...?</b>	
VQS 117	I mean in terms of space actually, the mix of the Kindle and a smart-phone now, I've ditched carrying round a laptop around entirely which is very nice, so the smart-phone allows me to check my email easily and do a few other tasks and then the Kindle takes care of all the reading and having the bigger screen. So for me, that is a huge space and weight saving, which is very good.	Location, habit, weight,
VQS	So yeah, I couldn't imagine going back to a laptop, at least not for the time	Location,

118	being.	habit, weight,
VQS 119	<b>OK, so its reduces the weight you have to carry around all the time?</b>	
VQS 120	Yeah.	
VQS 121	<b>And you're using your Smartphone for more personal information management like sending emails, keeping a diary, and then you switch to the Kindle to read ...?</b>	<b>PIM</b>
VQS 122	Yeah.	
VQS 123	<b>Some participants compared to two quite heavily, and they were quite negative about the ebook reader, compared to their Smartphone which was much more enhanced and...</b>	
VQS 124	I would say they're complementary rather than competing. Yes, chalk and cheese, they do completely different jobs. I would read very little on my Smartphone, I mean it's painful enough to read a long email on it, let alone a book, but it very efficiently makes use of things like the calendar and email.	Tools, multi-single, duplication? See: VGP 166, QGS 98, GQP 142
VQS 125	<b>Could you see these two come together in one device? I mean the web browser is already partly there.</b>	
VQS 126	Yeah, I mean I think... I don't think the screen will... the screen technology at the moment will never ever... won't replace an LCD panel, so for that reason I can't see them merging for the time being.	Tools, screen, LCD
VQS 127	You can possibly see... well you could possibly see one device there as multiple screens and different types of screens, yeah. I somehow think the LCD screen is going to be here to stay for quite a while so they'll remain separate I think for quite a while.	Tools, screen, LCD
VQS 128	<b>How was your experience of the e-ink compared to screens? Is that really that much of an advantage over a LCD screen?</b>	
VQS 129	Yeah, I was stunned when I first saw the quality of it, and I think Amazon make best use of that with their screensavers that they have on it, because you show that someone who has never seen an e-book and they are just stunned by how good it is, compared to paper and compared to LCD screens. I mean it's just amazing, the quality of it.	Rules, screen saver, see: NUS 252, WHS 178
VQS 130	And then when you tell them that that image is not using any power at all, and again the idea of two weeks' battery life off a device so small.	Tools, battery, see: VGP 92
VQS 131	<b>Yeah, and how does that compare to reading Is it really easy on your eye?</b>	
VQS 132	Yeah. It's more a case actually of the document that you're using, so has it been optimised for the Kindle screen, which is why I've done the template in Word for it, and also why I'd like to standardise the documents students submit because some of them were just a bit marginal to read, and then when you zoomed in, you then had this pain on the Kindle of flipping between the left and right side of the page. So having the template should help.	Tools, reading experience, see: NUS 60
VQS 133	<b>OK. Your relationship with other colleagues etc, did you use it to share information or is it only a matter of showing them how good it is? In terms of collaboration, does it have a place there?</b>	
VQS	Well I think it does. The ability of Amazon to be able to send documents to	Tools,

134	them and then stream them back to the Kindle, could be very useful. It's not an email client though so, so what you don't want to be doing is receiving 100 documents through it, that would really drive you mad, but in terms of collaboration that could potentially be seen as useful.	Community, division of labour, relation other tech, see: VGP 150
VQS 135	And again if we were to give these to distance learning students, being able to stream documentation to them. Again you don't want to overdo it, but being able to use that in conjunction with StudySpace could be quite useful. But I think it would have to be designed carefully so you would probably want to try it on one module first, just to see how you could best incorporate it.	Object, Tools, Community, division of labour, relationship other tech, relation other tech, see: VGP 150
VQS 136	<b>Yes. Did you use it with others so far?</b>	
VQS 137	I haven't done. There's only a couple of colleagues that have according got one so... And most people are using it to read books while they're on holiday or read papers when they have the time to. I haven't come across many people that are using it for marking at the moment.	Object,
VQS 138	For a lot of staff that aren't particularly digital in their approach to work, it's a double hurdle for them in that they've got to completely change the way they work to a digital work flow, and then they've got to get their head around using something like an e-book reader so I suspect they'll find it harder. For me the switch was relatively easy to do, so I think what this shows actually is that we're getting closer to that tipping point where everything is becoming digital and those staff that are less happy with that, are just finding it harder.	Community, Recommendation,
VQS 139	<b>But you could see a situation then where minutes and notes or committee papers are emailed around over the Amazon client, to an e-book reader for example, a couple of days in from the meeting?</b>	
VQS 140	You could do. I guess the problem on the Kindle at the moment is its lack of not having a particularly good way of sorting or tagging that information because you can imagine getting 20 or 30 documents suddenly appearing on your home screen and it would be better to have a more streamlined way of doing that. So being able to ... Well, you're essentially talking about, not turning into an email client, but having a filtering system somewhat similar to an email client. So if you know... You can obviously set your Kindle account up so you can only receive from certain people, and what would be nice, for example, is if you have one email address that you're receiving from, all of that goes into a set folder, and then you could automatically tag and then you could look at that when you're ready to. I get the impression that some of those capabilities are probably being looked at but it might take a while for that to be added into the Firmware.	Community, Tools, division of labour.
VQS 141	It's perhaps still a little bit rudimentary, but what it does, it seems to do very well and it doesn't seem to have any bugs at all in it, or if there are bugs, they're quite minimal.	Community, Tools, division of labour.
VQS 142	<b>As it is, would it be a device you could share? Give it away to a colleague for example to read something? So it's like if you have printed a journal article, you would just pass it on to see... because it could be useful or interesting for them – would an e-book reader be</b>	

	<b>something you would pass on ...?</b>	
VQS 143	Yeah, I guess so. You start thinking then in the same way with a laptop about security and such like, and of course there are no security features, it is just a filing cabinet you can open and start reading. So I mean, yes, there's a case to be said for having secure areas on it which could be encrypted and there's no reason why they can't... they've got a keyboard so you could have password access to certain folders. So in the same way you would pass a paper or a book for someone to look at, yeah, why not do that with a Kindle? But I think yeah, you'd want to have a bit more security, or different levels of security on it.	Tools, organisation, security
VQS 144	<b>But in a way it's more an individual device?</b>	
VQS 145	It is yeah. It's not quite as personal as a phone but it's getting that way.	
VQS 146	<b>OK. Would you recommend one to a colleague?</b>	Community, Recom- mendation,
VQS 147	Yeah, yeah, I would, very much so.	
VQS 148	<b>For what reason?</b>	
VQS 149	Just for... well, the quality of the display and the flexibility. The obvious one is if, for example, you're doing a book review for a journal and you've got a 500 page book then you don't have to carry a bit slab of text around with you which is great.	Community, Recom- mendation, weight.
VQS 150	<b>OK. So it's more or less for similar reasons you are using it?</b>	
VQS 151	Yeah.	
VQS 152	<b>OK. The Kindle in a way is very good in displaying its own native files and if you download books for example from the public domain, those books are for free or some books are not expensive, so in a way it directs itself more or less towards leisure where you read a book in a linear form. How does this relationship between leisure reading and work reading in your case works out?</b>	
VQS 153	I don't tend to do much leisure reading at all. I'm so worn out from doing work reading, so (LAUGHS).	Rules, Leisure,
VQS 154	<b>You don't read for pleasure anymore?</b>	
VQS 155	No, no. Not that often.	
VQS 156	<b>That's ?? there is no separation in a way because...</b>	
VQS 157	I know for some people they'll often use a library a lot and they don't like the idea of purchasing books, so for some people the Kindle wouldn't be of any interest for that reason. I know they've been thinking about having a Kindle lending library, but I haven't looked at how that works, so you could potentially say the same.	Tools, community, relationship other tech, borrowing, see: NUS 224
VQS	Well in terms of text books there's a similar case to be said for borrowing	Tools,

158	books and clearly the library here does have licences for e-books but I don't think there are any licences for e-book readers at the moment.	community, relationship other tech, borrowing
VQS 159	<b>Well there is... I think with a select group they experienced ... that's only in the case of the Kindle, if you purchase a book from Amazon, you are allowed to give it to somebody else more or less to read, so you've got now these special websites where you can exchange books for a certain period, but in a way they are always yours, and you can't pass them on so easily to others, but you are allowed to, for a certain period of time...</b>	Borrowing
VQS 160	It would be interesting to see if they could get that to work at the library here. So if you had a textbook, could you borrow it for 2 weeks?	Tools, community, relationship other tech, borrowing
VQS 161	<b>Yeah, that would give it a little bit more flexibility and also it would extend the library in a way, and of course you've got these numbers, how much of these books do you need and how much is the cost, etc? That needs to be sorted out.</b>	
VQS 162	Yeah, a bit more thinking to be had, so I mean instead of borrowing the whole book, you could maybe borrow a chapter for a week which might be something that the publishers would be happy with actually, because at the moment the way e-books are set up, yeah, it's quite often a case of going in and looking at a certain chapter. It will be interesting to explore further with that.	Rules, Tools, community, relationship other tech, borrowing
VQS 163	<b>OK. What did surprise you on the e-book? What was surprising on it?</b>	
VQS 164	I guess with the Kindle they focused on usability and they've kept things very very simple, and as a result you start it up and I think 90% of people would be able to use it straight away and get most of the functionality without any issues at all. The Sony was trying to be a premium device, but I don't think they... Well whereas with the Kindle you could see their initial core market were hardcore readers that wanted to read lots and lots of paperback novels and they have produced a reader that does that incredibly well, and I guess perhaps more importantly, is incredibly cheap for what you get.	Tools, HDI, usability,
VQS 165	Whereas the Sony was meant to be a premium device and some things... I mean it's certainly better made, better quality. You have the ability to use things like memory sticks on it which could be quite useful, but you lacked features like wifi and as a result I also found it wasn't quite as intuitive to use as the Kindle because they seemed to be adding more complexity to the interface.	Tools, HID, Kindle-Sony, see: WHS 104
VQS 166	<b>Yeah, and then the trade-off could be because you've got enhanced functionality but in your case you didn't use a stylus in the end, and you didn't really use it to store the marks, offer notes or anything, so they add some extra complexity to it that didn't pay off in a way in its functionality.</b>	Tools, HID, Kindle-Sony
VQS 167	No.	
VQS	<b>Was there anything you couldn't do on it that you might have expected</b>	

168	<b>to be able to do?</b>	
VQS 169	Well I thought the tagging would be... I mean I've said that already, I thought the tagging would be far better than it was on the Kindle, so I was disappointed at that because I thought it should have been better. And the other thing which has just been fixed in the latest Firmware release which I did look for actually was page numbers, which was... has long been commented as an odd omission from it, so you can now actually tell people to go to page 55 and on a Kindle it will actually be able to do that now. (LAUGHS). So, yeah, that was quite odd, having not been there.	Tools, reading organisation, page number
VQS 170	And of course it can do things like, like I say, go to web-pages. You can play audio files on it or audio books. You can use it to view jpegs, a directory full of images, so those things could be useful in certain situations. You can imagine taking them out on fieldwork for example and you may have directories full of images or an audio podcast to follow it and it could do all of those things and have a field guide; again, yeah, so it would be quite flexible for that.	Location, tools, fieldwork, community, division of labour, object
VQS 171	<b>Hmm. Yeah. That brings me back to the question maybe I skipped over a little bit, is the orientation of the text, how does that work out for you, because some participants had a real book comparison if they used this kind of device, and if they have heavy textbooks, of course you know more or less where you are, you can see where you are more or less in the book and not having a page number for example, how did you overcome this orientation...?</b>	
VQS 172	I guess I'm just used to working with electronic text, so my first thing, I did a search for it. Or use a table of contents and click through to it, so that's how it would work on a desktop and that's how it works on a Kindle, so that's not so much of an issue.	Rules, reading experience, landscape.
VQS 173	<b>OK, so I'm sure it was the way you overcome this kind of orientation.</b>	
VQS 174	Yeah.	
VQS 175	<b>OK. Is there anything you would add to the e-book reader, bits which would really enhance its functionality?</b>	
VQS 176	Oh, colour I think would be very useful. The screen size would be interesting, I'd say it would be interesting to try a DX, but obviously the bigger it gets the less flexible it becomes, so I don't know if there is an ideal size but it would be interesting to see what different sized devices were like. Yeah, having the wifi is fantastic, I think that's very useful. So Sony have really missed something in not including that.	Tools, screen size, wifi,
VQS 177	No, I think by and large it does everything I think I'd want it to do. I mean again, perhaps a memory card slot possibly for it, which would allow you obviously to expand the memory as well as copy content onto it, so that could be quite useful.	Tools, screen size, wifi,
VQS 178	<b>Yeah, unless you can't tag it. I mean you need this kind of indexing in a way.</b>	
VQS 179	Yes, and yeah, I mean that's perhaps one of the weaker areas on the Kindle, say indexing.	Tools, organisation, index
VQS 180	<b>Would it help if that was related to a reference management system in your case, if you really have a lot of books and you could use a</b>	

	<b>reference management system?</b>	
VQS 181	Yeah, it would be interesting to see if Amazon got into that actually at all, because obviously they will have... they have a back end which takes care of all of that, so being able to have a reference management system for that type of thing would be quite interesting. It wouldn't help with student projects but...	Tools, reference management system, see: VQS 105, GQP 76,
VQS 182	Yeah, for me actually, I always come back to the fact that being able to see a directory structure would just be so helpful and very simple to implement.	
VQS 183	<b>Yeah. That's how most people work.</b>	
VQS 184	Yeah.	
VQS 185	<b>(INAUDIBLE) your articles in...</b>	
VQS 186	I know the big thing in Web2 is tagging everything but that can become such a hassle to do, and yeah, for a lot of people just having a directory structure would make life a lot easier.	Rules, Tools, directory structure, see: VQS 105
VQS 187	<b>I can see that. OK, well I'm more or less at the end of my questions, is there anything we didn't cover?</b>	
VQS 188	No, I don't think so. I think that was pretty thorough.	
VQS 189	<b>Great. OK, shall we leave it here?</b>	
VQS 190	Yeah, yeah, that's good.	



## Coursework coversheet

Student's name	Hendrik van der Sluis	
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Any Additional Information		

### Statement:

I confirm that I have read and understood the Institute's Code on Citing Sources and Avoidance of Plagiarism. I confirm that this assignment is all my own work and conforms to this Code. This assignment has not been submitted on another occasion.

**Signed:** .....Hendrik van der Sluis... **Date:** ...07/07/2011