

The Impact of e-Books on Young Children's Reading Habits

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Abstract This article reports on a pilot study which aimed to consider the e-book reading experiences of young children and their families, with currently available portable e-reader devices: Amazon Kindle, Nintendo DS-lite and Apple iPod Touch. Three families, each with two children in the 7–12 year age range, experienced an e-reader for a two-week period. They recorded their experiences in a diary and were interviewed at the beginning and end of the study. Key findings include the fact that, of the six children involved, four rate themselves as 'enthusiastic' readers, one 'average' and one 'reluctant'; whilst all six of the parents enjoy reading. At the end of the study, all of the participants chose the Kindle as their preferred device and found it the easiest to use. In addition, there were indications that the one reluctant young reader (a boy aged eight years) was inspired to read by the Kindle. His parents were pleased with this enthusiasm, noting that he was reading rather than watching television, excited by downloading and choosing books and it was the only time they had known him to ask to read voluntarily. When asked whether they prefer printed or electronic books, all of the adults chose printed books, whilst the children were more ambivalent, with half preferring electronic books.

Keywords e-Books · e-Readers · Children's literature · Child readers · Families reading · Amazon Kindle · Nintendo DS-lite · Apple iPod Touch · Reluctant readers

Forms used for readers and parents are available from the author.

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Background

The importance of reading undertaken in childhood cannot be underestimated; it provides a love of reading for pleasure as well as a foundation for the acquisition of knowledge. In the United Kingdom, the significance of literacy and the development of reading skills are issues which have been reinforced by their becoming a priority for Governments. There have latterly been a number of high-profile, government-funded initiatives to promote reading and to improve literacy, such as a second Government funded Year of Reading 2008 [1], the National Reading Campaign [2] and 'Reading Champions' [3]. These apply to both adults and children, but it is important that young people develop reading skills as early as possible. These initiatives have been introduced to some extent to counteract anxieties that "the proliferation of other media competing for children's leisure time—television, film, DVDs, computer games and the internet—presents a genuine threat to the more traditional activity of reading" [4].

Reading is an integral part of the way we learn and it is important to understand how best to encourage children to read for enjoyment as well as when they are required to for other reasons. Research has shown that young people who enjoy reading do it more frequently and tend to become skilled at it [5], so schools have an important role to play in trying to encourage children to read for enjoyment. Educators believe that incorporating recreational reading into classrooms can not only improve literacy development but also set a structure for children to follow in their reading [6]. Therefore, by fostering a reading culture in the classroom, children can be encouraged into good reading habits, which can then be transferred to the home. However, some research suggests that the school environment can potentially damage a child's enthusiasm to read. In a study of reluctant readers, Earl and Maynard highlight the importance of confidence when it comes to young people and reading, stating that children feel 'daunted' and even 'scared' by just the thought of reading. A child that feels this way may be deterred to a greater extent as a result of the technique of group reading used in schools, further reducing their enjoyment of reading [7]. It is therefore important that schools realise and cater for the needs of different readers, particularly those who are less confident. This can be done through different techniques, for example more personal or one to one reading, rather than the more daunting group reading sessions [7].

It can be argued that the family has an equally important role to play; a survey carried out in 2005 revealed that family members were influential when it came to recommendations for books, and that mothers and other adult females were particularly significant in the purchase of books for both boys and girls [8]. Research involving a national survey by the National Literacy Trust further demonstrates the importance of the home environment when it comes to children's attitudes towards reading: "Young people who get a lot of encouragement to read from their mother or father are more likely to enjoy reading, to read frequently, to have positive attitudes towards reading and to believe that reading is important to succeed in life than young people who do not get any encouragement to read from their mother or father" [9]. The home environment is the most accurate predictor of a pupil's achievement, and literacy is a good opportunity where parents can make a

difference, as simple actions such as being read to or even just being exposed to books, can impact a child's progress in learning to read [9]. This evidence suggests that, to a large degree, a child's attitude to reading is affected positively by the attitude of their parents. Therefore, if a positive relationship with reading is promoted in the home, it is likely to be passed on to the children.

It is important to note, however, that many children themselves are aware of the benefits of reading, yet they are not necessarily motivated to read as a result. According to the National Literacy Trust, while self-defined 'non-readers' saw 'readers' as people who are likely to 'do well' and people who are 'intelligent', conversely they also thought that 'readers' are 'geeky' and 'boring' [5]. Since the majority of children do not start out with a reluctance to read, it seems that this attitude develops as children progress through school. According to surveys in America, virtually all children attending kindergarten want to read when they first go to school, but this enthusiasm dies down as they progress through their school lifetime [10]. This argument is reinforced by Stauffer, who states that there is plenty of evidence that children's attitudes toward reading become more negative with age [11]. Therefore even with the advantage of a home environment which is positive about reading, a child may still become a reluctant reader at some stage of their school life.

The challenge then is to identify why some children lose their desire to read and to investigate what they might prefer to do with their time. That is, what alternatives to reading exist, and what effect might they have on children's reading practices? New technologies and a range of other activities compete for children's attention, which may result in less time dedicated to reading. In a study investigating which factors influence a child to read, McKool found that children who watch more television and take part in 'organised activities' do less voluntary reading. This supports the argument that activities such as watching television displace time that could be spent reading [12], and as more advanced technologies appear, many may view the 'old fashioned' book increasingly negatively. Young people nowadays are often more comfortable sitting in front of a computer surfing the web than they are sitting reading a book, with the suggestion being made that readers no longer have the concentration to read articles through to their conclusion [13].

As a result of the decreasing interest in reading and the growing appeal of computers, it has been suggested that the electronic environment is becoming more important to the growing number of children who do not respond well to traditional print media and who are reluctant to read. New technologies are now in existence which could change the way children (and indeed the rest of us) read. Electronic Books (or e-books), can potentially bridge the gap between printed media and other, more interactive, forms of media. Recent research shows that books read on electronic devices, such as the Kindle and the iPad, satisfy users as much as printed books, despite reading speeds being generally slower [14]. It seems that an increasing number of people are embracing e-readers and e-books; perhaps the biggest indication yet that a shift has taken place is the fact that Amazon's e-books have begun to outsell their hardback equivalents in 2010 [15]. The recent release of the iPad is likely to see the further promotion of e-books, as has the launch of Amazon's new Kindle device and its recent availability on Amazon's UK

website [16]. This has led to new and renewed predictions of “traditional texts” eventually being “superseded by electronic books” [17].

The e-book represents the combination of the advantages of the printed book with the capabilities of the computer. As a result, the e-book is likely to be quite similar to a printed one in that it will have pages incorporating text and pictures, but it offers an extra dimension in that it has the potential to include additional media. Therefore, the electronic book can add more to the text and pictures in terms of animation, sounds, and a narrator [18], which may render it attractive to children, in particular those for whom visual literacy has become very significant. Electronic books might, therefore, have the power to bridge the gap between print and other media, and thereby encourage reading in those children who are reluctant readers [19]. In fact, it can be argued that e-books allow users to do more than simply read the book because they offer increased levels of interactivity through simple features such as being able to check the meaning of a word simply by highlighting it.

Interactivity is one of the areas in which children might benefit from e-books. Warren [20] discusses “digital novels”, which can combine ‘text, audio, video, special effects and gaming’. Such a combination of media allows users to be involved in the story they are reading, which is likely to appeal to many children. Another study investigated whether an interactive e-book could improve literacy amongst kindergarten children and found that the book had the potential to improve the children’s literacy as well as to amuse and motivate them. It is noteworthy that this research showed that further research investigating e-books and educational e-books is needed [21]. It is also clear that the interactivity of e-books is continually developing, as is the market for e-books and e-readers.

Previous incarnations of electronic books for children, particularly those on CD-ROM, have not proved to be particularly successful. However, the indications are that the new generation of portable e-book readers might prove more attractive to children, particularly those who are reluctant to read. The research described in this article is a first step towards finding out how children react to these new devices.

The Study

The study reported in this article is a pilot project which investigated the e-book reading experiences of young children and their families. The aim and objectives of the research are as follows:

Aim

To consider the experiences of e-book reading of young children and their families, with currently available portable e-reader devices.

Objectives

- To ascertain the existing reading habits of a group of young children, and their parents’/carers’ attitudes towards those reading habits

- To investigate the level of each family's access to, and use of, electronic media (computer games, internet/social media, television and so on)
- To give young children and their families the opportunity to read e-books on three portable e-reader devices over a six week period, and to record their experiences
- To investigate the initial opinions of young children and their families relating to each e-reader device as soon after use as possible
- To invite the children and their parents/carers to offer their opinions of all three devices after the six week period of use

Methodology

Three devices on which e-books can be accessed were selected for the study. In keeping with recent e-book developments these were:

- Amazon Kindle
- Nintendo DS-lite
- Apple iPod Touch

These devices provide a good variety between dedicated e-book devices (Kindle), cutting edge fashion technology (iPod Touch) and games-based platforms (DS-lite). The Apple iPad was considered for the study, as its launch had been announced; however, it had not been made available in the UK when the study began in mid April 2010.

Three families, each with two children in the 7–12 years age range were approached and agreed to take part in the study. At all stages, data were collected from the family as a whole, with parents/guardians present. It was thought that this would not only provide parents with greater confidence in participating in the research, but also that adults would be more inclined than children reliably to complete the second stage of the research (diary recording). The research involved a three stage method, as follows:

Stage 1: Interview to Determine Current Reading Habits

Parents of children were asked about the extent to which their child interacts with printed fiction at home during a typical week. The interviews uncovered the degree to which children enjoy reading print books, the level of encouragement given to children within the family environment and the child's acceptance and use of printed books in relation to alternative electronic media (e.g. computers, internet/social media, computer games, television etc.) and to other activities. They were also asked about their previous experience of electronic storybooks. The adults were also interviewed about similar issues.

Stage 2: Diary Recording

The diary exercise took place over a six-week period. Participating families were given an e-book reader to use for a two-week period and were provided with a brief orientation session (and written instructions) explaining how to use the device and how to identify, purchase and download e-book titles. For the Kindle, the downloading was undertaken through the device's own delivery process; for the sake of convenience downloading on the iPod Touch was undertaken through the Kindle app, which is available free of charge. Where appropriate, families were provided with vouchers (maximum value £40) to download any titles they wished to read on the device. At the time of the research, the children's books which were available for the Nintendo DS-lite (essentially a games console) took the form of games cartridges entitled "Flips" [22] and were therefore relatively limited in scope. Taking into account the age of the child participants, families were provided with three cartridges on which could be found a series of interactive versions of books: *Artemis Fowl* (*Artemis Fowl*; *Artemis Fowl and the Arctic Incident*; *Artemis Fowl and the Eternity Code*; *Artemis Fowl and the Opal Deception*; *Artemis Fowl and the Lost Colony* and *Artemis Fowl and the Time Paradox*) and Cathy Cassidy (*Angel Cake*; *Scarlett*; *Shine On Daizy Star*; *Ginger Snaps*; *Sundae Girl* and *Driftwood*). These same books were pre-loaded onto the Kindle and the iPod Touch. For the adults interacting with the Nintendo DS-lite, *100 Classic Book Collection* was provided—this is similarly a cartridge which includes classic texts such as *Sense and Sensibility*, *Treasure Island*, *Moby Dick* and *A Midsummer Night's Dream* [23].

Parents were asked to spend at least 20 min per day using the e-book reader with their children, but encouraged to use the readers in any manner that fitted in with their child's reading habits. They were also encouraged to make use of the device themselves. Participants were asked each day to complete a paper diary outlining the number of times the child used the device, the duration of use, and to record their thoughts and observations on the interactions between the child and the e-book. At the end of each two-week period the family was interviewed about the device they had just been using and provided with a new device, orientation session and written instructions. As a result, during the six-week period each family had interacted with all three devices.

Stage 3: Debrief Interview

At the end of the six weeks, each family was interviewed and asked to comment on their attitudes towards the devices used and the titles they had read, the impact of e-books on the levels of engagement, and the pros and cons of the e-book readers used.

Ethical Issues

As noted above, data were collected from the parents of children and at no time was there any contact between the research team and a child without a parent being

present. Letters of consent were completed by all families, who were informed that they could withdraw from the study at any time. Diaries would be destroyed once data analysis was complete (or within six months from the completion of the data gathering exercise—whichever is earlier).

Results and Discussion

The participants in the study were made up as follows:

- Family 1: mother, father, boy (11 years), girl (9 years)
- Family 2: mother, father, boy (11 years), boy (8 years)
- Family 3: mother, father, girl (12 years), girl (10 years)

The families were all living in Loughborough, Leicestershire, UK and the surrounding area. All interviews and orientation sessions with the participants took place in their home.

Initial Interviews: Children

When questioned about how they rated themselves as a reader, four of the children thought they were ‘enthusiastic (you read a lot, with pleasure)’, one was ‘average (you read an ordinary amount)’ and one was ‘reluctant (you only read when you have to)’. The child participants were also asked to name their favourite books and authors; only one of them could not name their favourite books. The books which were favoured by the children included series books (Harry Potter, Murderous Maths, Animal Ark) and non-fiction; the favourite authors included Cathy Cassidy, Enid Blyton, Cressida Cowell and (perhaps unsurprisingly) J K Rowling.

The interviews with the children revealed that three of the six borrow books from school, and just two borrow them from the public library. All have a computer with internet access at home, and Nintendo DS and Wii games consoles, with three also having Game Boy consoles. None had previously read any storybooks on a computer.

Initial Interviews: Adults

All six of the participating adults claimed to enjoy reading and to buy new books (from the local bookshop, online retailers and supermarkets) rather than borrowing them—none of them use the public library, although two regularly borrow books from friends and relatives. Four of the parents (both adults from families 1 and 2) read to one of their children (the younger one in each case) for 20–30 min per day. In addition, all six of the participating adults are conversant with technology, having both a computer and a digital music (MP3) player. Three have a smartphone or PDA.

In summary, it can be said of the participating families that there were six parents who enjoy reading, with four children who are “enthusiastic” readers.

Diaries

As discussed above, readers were asked to complete the diary proforma with the date of the reading session, the device used, the title of the book being read, the beginning and end time of the session and who was involved. Space was provided for further comments so that the participants could note any problems or difficulties they had experienced, or any thoughts, opinions or feelings which occurred to them during and after their use of the various devices.

The diaries showed that the average time spent reading e-book content on the devices by the children was 32 min per day and for the adults it was 33 min per day; overall the average time was 32 min per day. Reading times were affected by the study, that is, all participants read more as a result of their participation in the research because they were conscientious in reading the devices regularly every day.

Interviews After Experience with Devices

The interviews with the families after use of each device revealed many issues relating to their reading with the three different electronic book devices. It was clear that the books which were selected for reading often related to those which had already been downloaded/provided, although some additional texts were purchased (specifically *The Talking T-Rex*, *The White Wolf*, *Percy Jackson and the Sea of Monsters*, *Eclipse*, *Helen Keller*, *My Sister's Keeper*, *Bob Dylan: intimate insights from friends and fellow musicians*, *Moby Dick* and *The Other Family* on the Kindle and *Percy Jackson and the Sea of Monsters*, *Moby Dick*, *The Yellow Yacht* and *My Sister's Keeper* on the iPod Touch). Clearly, some of the participants did not finish reading a book on one device, and continued with it on the subsequent e-reader. For example, one participant began reading *Moby Dick* on the Nintendo DS-lite (because he had always wished to read it) and continued with this text on the subsequent two devices.

The books chosen by the children reflected their liking for series books and their initial preferences; the popularity of series is evident in other research (see, for example, [8]), with the Percy Jackson series an obvious example in the case of the current research.

When reading the Nintendo DS-lite interactive books, the added features (the pictures, quizzes and item collection) were particularly popular with the children. The 8-year-old boy commented that, although he had found the *Artemis Fowl* books to be overly advanced for his reading abilities, he had enjoyed scrolling through the books and collection items. This participant was also attracted by the pictures in the books he downloaded onto the Kindle.

Specific comments relating to each of the three devices were invited. In relation to the Nintendo DS-lite, two participants commented that the device had a small screen, but they had become accustomed to it quite quickly. Two adult participants found the DS-lite to be more convenient than a book in terms of size and keeping their place, and that it was “better” than they had expected. As a result of more than one person reading a book at the same time, one family noted that multiple

bookmarks would have been convenient, so that more than one person could keep their place in the book.

When discussing the iPod Touch, several participants noted it had a small screen, which they had sometimes found to be inconvenient. Similarly, some of the participants (particularly adults) experienced difficulties with the screen lock, which automatically puts the device to sleep if it is not used for a particular period of time. However, participants noted that they soon became accustomed to this feature of the iPod Touch. The page turning facility on the iPod Touch had also caused some problems, with two participants claiming it took them some time to become accustomed to this aspect of the reader. The iPod Touch was the only device with which any of the readers had problems when downloading books. All of the participants agreed that the portability of the iPod Touch was a very positive feature, and that they could read their book wherever they found themselves (e.g. the doctor's waiting room), as long as they had the device with them.

Comments in relation to the Kindle were generally positive, with participants noting it to be easy to hold; indeed, two of the children said that the device was lighter than a hardback book and therefore easier for them to handle. This also made the Kindle convenient to read lying down. Navigation within the Kindle was found to be easy, and it was similarly simple to turn the pages. The Kindle screen, which is matt in nature, was complimented and one participant commented "I found the Kindle easy to use and clearly set out". In one family the Kindle was so popular the children had been arguing over which of them could read with it first; here it was noted that it is difficult for more than one person to make use of the Kindle device at one time. More negatively, one participant had found searching on Amazon for books less than ideal because they had found it difficult to refine their search. In common to all three devices were the comments that it was difficult to move around the book, and not easy to know how far it was to the end of the chapter currently being read.

After use of each device, participants were asked to indicate whether they believed they had read faster, slower or at the same speed as when they read a printed book. As can be seen in Table 1 (below), for the Kindle a slightly higher proportion chose "faster" and "the same", with only one thinking they had read more slowly with this device. Responses relating to the other devices were more similar. It is, of course, important to note here the low number of respondents, which means that the results cannot be generalised to a wider population.

When the families were asked to rate various features of each of the devices, the results were as shown in Table 2 (below). As can be seen, generally the features were rated "good" or "ok" by the participants and once again the Kindle scored highly.

Table 1 Reading speed of devices compared to printed books

Device	Faster	Same	Slower
DS-lite	2	4	4
iPod Touch	3	4	3
Kindle	5	3	1

Table 2 Opinions of selected features

	Good	Ok	Bad
Page turning			
DS-lite	7	1	2
iPod Touch	4	5	1
Kindle	8	2	0
Size of print			
DS-lite	9	0	1
iPod Touch	6	4	0
Kindle	9	1	0
Display quality			
DS-lite	6	2	2
iPod Touch	3	6	0
Kindle	10	0	0

Reluctant Reader

As noted above, only one of the six children taking part in the research claimed to be a reluctant reader; this was the boy aged 8 years (child participant A). His reaction to the Kindle in particular was of significance in the context of the study. For example, A’s parents were particularly pleased with his enthusiasm for the Kindle, noting it was the first time he had ever asked them if he could read, and that he voluntarily read from the Kindle rather than watching television—an unusual situation for A. In addition, A was very excited about choosing and downloading books for the Kindle and was a willing participant in this process. Lastly and as noted above, A liked the pictures on the Kindle books which he downloaded and although he did not read any books on the DS-lite, he enjoyed scrolling through and experiencing the more interactive aspects of the texts.

Final Interviews

The interviews with the families at the end of the research period were also instrumental in revealing various significant issues relating to their reading with the three different e-book devices. When asked to name their preferred device of the three they had experienced, all 12 participants chose the Kindle. They all found the Kindle the easiest to use, noting it was easier to read, a good size for reading and convenient to hold.

Even after their experience of electronic books, when asked whether they preferred printed or electronic books, all six of the adult participants noted that they favour more traditional printed books. The reasons given included the fact that they were accustomed to printed books, they liked their portability, there are no issues with battery power and they prefer the visual aspects of printed books (being able easily to see how far through the book you have read). When asked the same question, the child participants were more accepting of e-books, with half preferring these and half preferring printed books. Two of the children stipulated preferring an

e-book as long as it was a Kindle, reinforcing the popularity of this device in this research. They found the Kindle in particular lighter and easier to hold, and noted that the pages do not turn by accident, as they can when reading a printed book. The younger participants also thought that there was more choice amongst printed books.

When asked about downloading electronic books, six of the participants (all adults) noted that the Kindle was more convenient than the iPod Touch. The children did not comment as they had not been involved in the downloading process. All but one of the participants felt they had read more because of their involvement in the study; this is borne out by reading times (discussed above). Three of the participants said that they would consider buying a reader (one parent and two children); in all cases the purchase would be a Kindle reader rather than the other two.

Conclusions

It should be borne in mind that this research features a very small sample, carried out as a pilot study and a precursor to more wide-ranging and substantial research. Despite this limitation, however, it can be seen that the research has revealed some significant indications about the potential impact of e-books on young children's reading habits. It has also provided a basis on which more wide-ranging but associated research can be established.

Importantly, the three families were all able relatively simply to read with the devices, none of which they had used before. There were some initial problems, which included finding bookmarks and turning pages (on the iPod Touch), the re-orientation of the screen when the iPod Touch device is turned, pressing the wrong button (on all three devices), and accidentally deleting a book (on the Kindle)—these were all easily resolved once the process being undertaken was properly understood. The other notable difficulty related to the iPod Touch—one of the three families did not possess wi-fi and was therefore unable to download books using Apple iTunes. This was overcome by one of the research team downloading books on their behalf; however, this was not an ideal situation and led to a delay in the family receiving their reading material. Such a limitation would impact on the design of any wider study. Lastly, since the Kindle device was obtained from the USA, the mains connection was not suitable for use in the UK, and had to be charged when connected to a PC. This was commented on by the families as being a slight inconvenience; they would have liked the option to charge using the mains. Since the completion of the research, this difficulty has been overcome as a result of the Kindle becoming available in the UK.

It can be concluded from the research that, amongst the participants to the study, the Kindle was by far the most popular device. All of the participants chose this device as their first preference amongst the three involved in the study and the reasons they gave for this choice suggest that the Kindle benefitted from being a dedicated reading device. That is, the features associated with a printed book are

presented well on the Kindle, compared to the other devices which are intended to be used for other purposes (games, music and so on).

The research also shows that e-book readers might be beneficial for reluctant readers. Although it is noted that this relates to just one child in this small-scale study, the indications are that this new technology was of interest to a child who enjoys interaction with computers. Furthermore, the Kindle in particular encouraged the reluctant reader to read, and to decide to read through his own volition. It should, of course, be remembered that there might have been a novelty effect at work, due to the fact that the families only had the devices for a two-week period. Longer term use of any of the three devices might result in a decrease in interest; further research would take this issue into consideration.

Finally, it is important to note that all of the participants were receptive of all of the devices (particularly the Kindle), although it might be a result of a wider interest in new technology, evident in the other media to which they have access, and in the fact that they were willing to participate in this particular research. It is also noteworthy that the child participants were, on the whole, more receptive of the e-book reader devices.

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