Books with pictures and conversations? A study of electronic books for children and their readers

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by

Sally Maynard

A Doctoral Thesis

Submitted in partial fulfilment of the requirements for the award of

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Abstract

For the past 500 years, the printed page has served as the basic and major means of storing and presenting information and has become an everyday tool which most of us take for granted. Despite the obvious usefulness and universal nature of the printed book, however, the development of electronic technologies has led to the evolution of the concept of the electronic book. This represents a significant new medium, which offers added value to the printed book through its potential for including other media in addition to text on its pages. The thesis takes the electronic book as its main theme, putting particular emphasis on its relevance to children.

The thesis includes a discussion of whether electronic books can encourage children to read both more electronic and printed books, which establishes that television, film and audio versions of texts do encourage the reading of printed editions (and vice versa). The conclusion is reached that electronic books may have the potential to exhibit the same effect, depending how similar they are to television, film and audio. The nature of classic texts and their currently decreasing popularity are considered, in addition to whether the electronic medium can and should encourage children to read more classics. An increasing awareness of the classics derived from media other than print is identified, leading to children having misconceptions about the texts. It is concluded that electronic books might have the power to bridge the gap between print and other media, introducing children to the classics in a form which is closer to the original text.

An attempt was made to identify the elements which make an author popular in order that these could be incorporated into electronic books to make them more desired as reading material. Emphasising the views of children themselves, rather than critics, parents and other adults, a study investigated the popularity with young readers of the writer Roald Dahl. Participants found some qualities and characteristics in common between works by Dahl, thereby rendering them different from other books. Identifying what children like about a certain author would enable the inclusion of the desired elements into electronic books, thus encouraging children to read such books.

Leading on from the potential increase in children reading electronic texts, the proposition is investigated that the medium on which a book is presented affects the reader's comprehension of, and satisfaction with the book. In order to investigate the effect of the electronic medium on comprehension, reading ability and speed, a study of user interaction with electronic books was carried out comparing children reading an electronic book incorporating the book metaphor with children reading the same text in two different printed versions. No evidence was found to suggest that the added effects and visual dimension offered by the electronic book reduced participants' comprehension of the text. Indeed, there was an indication that electronic books of this kind might actually aid the reader's comprehension of a text.

If children are to read electronic books, where will they get them from? The embracing of the technology of electronic books is likely to have an effect on the principal book suppliers. The thesis therefore reports two questionnaire studies. The first investigates the opinions of children's librarians on the subject of electronic books, and the second concentrates on booksellers. Notable conclusions were that there is a positive attitude towards including electronic books as part of the children's library service, and a high proportion of libraries offer access to them, the majority through main libraries. Smaller book shops had not entered the field of selling electronic books in great numbers, and that there was general uncertainty about the place of such texts in such outlets. Respondents to both surveys believed that electronic books are durable, and can exist alongside the printed items within their concerns.

Lastly, parents and schools have a role in making electronic books available to children. Due to the lack of research on the attitudes of parents and representatives of schools concerning electronic books, the thesis includes a discussion of existing surveys and studies of computer equipment in homes, schools and public libraries in order to gauge the involvement of parents and schools. This research shows that the picture of access to computer equipment for children is fairly inconsistent across the three sources under consideration.

A general discussion follows, and overall conclusions are drawn, including that: the suggestion that electronic books can encourage children to read represents an area that is lacking in research and which would merit further work; the relationship between the printed book and its electronic counterpart is a symbiotic one; and the portability of electronic books is currently not of major significance, although this is likely to change with the increasing prominence of dedicated e-book readers.
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This thesis is dedicated to the memory of two beloved cousins

Simon James Gray (14.05.68 - 19.10.00)

and

Susan Elizabeth Till (11.11.63 - 04.03.01)
Table of Contents

Chapter 1: Introduction to the Thesis
1.1 The Emergence of the Electronic Book ......................................................... 1
1.2 Thesis Terminology ......................................................................................... 2
1.2.1 Electronic Book ............................................................................................................... 2
1.2.2 CD-ROM (Compact Disc Read Only Memory) ........................................................ 4
1.2.3 Reader .............................................................................................................................. 4
1.2.4 E-Book .............................................................................................................................. 4
1.3 The Relationship Between Printed Books and Electronic Books ................ 4
1.4 Children Reading Printed Books .................................................................. 5
1.5 Children Reading Electronic Books ............................................................. 6
1.6 Aims of the Thesis ............................................................................................ 7
1.7 Summary of the Thesis .................................................................................... 7
1.8 Hypotheses ........................................................................................................ 9
1.9 Thesis Structure .............................................................................................. 10

Chapter 2: Literature Review: The Relationship between Printed
Books and Electronic Books ............................................................................... 12
2.1 Introduction ..................................................................................................... 12
2.2 Definitions of the Electronic Book ............................................................... 13
2.3 Electronic Books compared to Printed Books ........................................... 16
2.4 The Book Metaphor ....................................................................................... 17
2.5 Electronic Books Replacing Printed Books ................................................ 20
2.6 E-Books and Dedicated E-Book Readers ................................................... 22
2.7 CD-ROM .......................................................................................................... 26
2.8 Children and Electronic Books .................................................................... 27
2.8.1 Visual literacy ............................................................................................................... 27
2.8.2 The decline in reading amongst children ................................................................. 28
2.8.3 The range of media available to children ................................................................. 31
2.8.4 Electronic books and reading ................................................................................... 33
2.8.5 Children's interaction with electronic books ......................................................... 34
2.9 Electronic Book Suppliers ............................................................................. 37
2.9.1 Libraries ........................................................................................................................ . 37
2.9.2 Booksellers ................................................................................................................... . 40
2.10 Conclusions ..................................................................................................... 42
<table>
<thead>
<tr>
<th>Chapter 3: Can Electronic Books Encourage Children to Read More?</th>
<th>44</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Introduction ....................................................................</td>
<td>44</td>
</tr>
<tr>
<td>3.2 Can Electronic Books Encourage Children to Read Other</td>
<td>45</td>
</tr>
<tr>
<td>Electronic Texts? ..................................................................</td>
<td></td>
</tr>
<tr>
<td>3.3 Can Electronic Books Encourage Children to Read More</td>
<td>47</td>
</tr>
<tr>
<td>Printed Texts? .......................................................................</td>
<td></td>
</tr>
<tr>
<td>3.4 Conclusions .....................................................................</td>
<td>49</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 4: The Role of Children’s Classics in the Electronic Medium</th>
<th>51</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Introduction ......................................................................</td>
<td>51</td>
</tr>
<tr>
<td>4.2 What is a Classic? ..........................................................</td>
<td>52</td>
</tr>
<tr>
<td>4.3 The Relevance of Classics to Children ................................</td>
<td>57</td>
</tr>
<tr>
<td>4.4 The Potential for Electronic Versions of Classic Books ........</td>
<td>61</td>
</tr>
<tr>
<td>4.5 Electronic Books and the Classics ....................................</td>
<td>62</td>
</tr>
<tr>
<td>4.6 Conclusions ......................................................................</td>
<td>64</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 5: Author Popularity: an Investigation of One Children’s Writer</th>
<th>66</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Introduction ............................................................................</td>
<td>66</td>
</tr>
<tr>
<td>5.2 Use of the Repertory Grid Technique ........................................</td>
<td>70</td>
</tr>
<tr>
<td>5.3 Method ...................................................................................</td>
<td>72</td>
</tr>
<tr>
<td>5.3.1 Participants .........................................................................</td>
<td>72</td>
</tr>
<tr>
<td>5.3.2 Elements ............................................................................</td>
<td>72</td>
</tr>
<tr>
<td>5.3.3 Procedure ..........................................................................</td>
<td>72</td>
</tr>
<tr>
<td>5.4 Results ..................................................................................</td>
<td>73</td>
</tr>
<tr>
<td>5.4.1 Constructs ..........................................................................</td>
<td>74</td>
</tr>
<tr>
<td>5.4.2 Elements ............................................................................</td>
<td>76</td>
</tr>
<tr>
<td>5.5 Discussion and Conclusions ....................................................</td>
<td>79</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 6: Young Readers’ Interactions with Electronic Books</th>
<th>81</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1 Introduction .....................................................................</td>
<td>81</td>
</tr>
<tr>
<td>6.2 Method .............................................................................</td>
<td>82</td>
</tr>
<tr>
<td>6.2.1 Experimental design ....................................................</td>
<td>82</td>
</tr>
<tr>
<td>6.2.2 Sample ...........................................................................</td>
<td>85</td>
</tr>
<tr>
<td>6.2.3 Experimental procedure ...............................................</td>
<td>85</td>
</tr>
<tr>
<td>6.2.4 Pilot study .....................................................................</td>
<td>87</td>
</tr>
<tr>
<td>6.3 Results ..............................................................................</td>
<td>87</td>
</tr>
<tr>
<td>6.3.1 Reading Scores ............................................................</td>
<td>87</td>
</tr>
<tr>
<td>6.3.2 Experience of the chosen text .......................................</td>
<td>88</td>
</tr>
<tr>
<td>6.3.3 General computer experience .........................................</td>
<td>89</td>
</tr>
<tr>
<td>6.3.4 General reading habits ..................................................</td>
<td>90</td>
</tr>
</tbody>
</table>
9.5.2 The medium on which a book is presented affects the reader’s comprehension of it ................................................................................................... 174

9.5.3 The embracing of the technology of electronic books is having an effect on the principal book suppliers ............................................................................. 175

9.5.4 Parents and schools have a role in making electronic books available to children ....................................................................................................................... 175

9.6 Recommendations for Future Work ......................................................... 176

References ....................................................................................................... 179

List of Tables

Table 2.1 Advantages and limitations of printed books ................................. 16
Table 2.2 Advantages and limitations of electronic books .................................. 17
Table 2.3 CIPFA Figures on CD-ROM in public libraries ................................. 40
Table 4.1 Suggested classic texts ................................................................................... 56
Table 5.1 Scale positions of common Dahl texts ................................................. 75
Table 5.2 Match of all Dahl texts for all participants ........................................... 77
Table 5.3 Common authors and features of elements not written by Dahl ......... 78
Table 6.1 Reading scores for the three groups ...................................................... 88
Table 6.2 Books being read by participants at the time of the experiment .......... 91
Table 6.3 Participants' use of different media for stories ...................................... 93
Table 6.4 Electronic books which participants had seen or read ...................... 94
Table 6.5 Multiple choice score mean and standard deviation ......................... 95
Table 6.6 Responses to Question 3 (15) ............................................................... 97
Table 6.7 Responses to Question 5 (19) ............................................................... 98
Table 6.8 Responses to Question 15 (10) ............................................................ 98
Table 6.9 Multiple choice score mean and standard deviation ......................... 103
Table 7.1 Age and gender of respondents to librarian study .......................... 117
Table 7.2 Age distribution for bookseller study ................................................. 118
Table 7.3 Definitions of the electronic book ....................................................... 119
Table 7.4 Comparison of purpose(s) for which electronic books are actually kept with purpose(s) for which electronic books should ideally be kept... 122
Table 7.5 Types of electronic book being sold/likely to be sold ....................... 123
Table 7.6 Popularity of electronic books ............................................................ 124
Table 7.7 Selectors of electronic books .............................................................. 127
Table 7.8 Criteria for selecting electronic books ................................................. 129
Table 7.9 Measures necessary in order to offer children access to electronic books in libraries/demonstrate electronic books in a book shop ..................... 132
Table 7.10 Combined attitude statements (in rank order of mean scaled
value) .................................................................................................................................................. 135

Table 8.1 Results of the Survey of ICT in Schools in 1999 ................................................................. 149
Table 8.2 Deployment of computers for teaching and learning in 1999 .............................. 149
Table 8.3 Distribution of the number of computer workstations in school libraries ......................................................................................................... 151
Table 8.4 Percentage of UK secondary school libraries with CD-ROM player................... 151
Table 8.5 Number of computers and computers with CD-ROM in each school library ........................................................................................................ 152
Table 8.6 Percentage of participants using PCs at school in 1997 ........................................... 153
Table 8.7 Main user of home computers in 1998 ........................................................................ 155
Table 8.8 Percentage of participants having PC and PC with CD-ROM in the home .............. 155
Table 8.9 Percentage who had PC at home compared with percentage who had used a PC at home ............................................................................. 156
Table 8.10 Percentage of participants having PC and PC with CD-ROM in their own bedroom .................................................................................. 157
Table 8.11 Location of PC in the home ...................................................................................... 157
Table 8.12 No. of computers in UK public libraries ................................................................. 158
Table 8.13 Provision of public access micros by local authority type ..................................... 158
Table 8.14 No. of PCs for hire and open learning ................................................................. 159

List of Figures

Figure 1.1 Model of an Electronic Book ................................................................................. 4
Figure 1.2 Thesis Structure ................................................................................................. 11
Figure 2.1 RocketBook (Nuvomedia, 2000) ...................................................................... 23
Figure 6.1 Scattergram showing correlation between reading score and multiple choice score ............................................................................................. 96
Figure 6.2 Number of right answers to multiple choice questions ........................................ 97
Figure 6.3 Multiple choice score in chronological order .................................................... 100
Figure 6.4 Average number of words per minute taken to read summary and text ............ 101
Figure 8.1 Distribution of the number of computer workstations in school libraries in 1997 ............................................................................................. 150

List of Appendices

5.1 The Nation’s Favourite Modern Children’s Author Poll – results
5.2 List of triads
5.3 Focused grid consisting of data relating to Dahl texts only
5.4 Individual focused grids
6.1 *Journey to the Centre of the Earth* – print out from electronic book
6.2 *Journey to the Centre of the Earth* – printed book version
6.3 *Journey to the Centre of the Earth* – summary of the story so far
6.4 Multiple choice questions
6.5 Order of multiple choice questions
6.6 Personal details form
6.7 Demonstration of an electronic (CD-ROM) version of *Peter Pan*
  6.7.1 Bookshelf – *Peter Pan*
  6.7.2 Book appears from shelf
  6.7.3 Book appears from shelf (2)
  6.7.4 Map (contents) page
  6.7.5 *Peter Pan* flies through the air
  6.7.6 Page 1 – *Peter Pan*
  6.7.7 Interactive mouse appears
  6.7.8 Interactive flowers
  6.7.9 Interactive dog
  6.7.10 Narration stopped
  6.7.11 Interactive tree
  6.7.12 Example of hypertext
6.8 *Journey to the Centre of the Earth* – contents page
7.1 Library study questionnaire
7.2 Bookseller questionnaire
7.3 Library study covering letter
7.4 Library study follow up letter
7.5 Bookseller study follow up letter
Chapter 1: Introduction to the Thesis

"and what is the use of a book, thought Alice, 'without pictures or conversations?"
(Carroll, p9)

1.1 The Emergence of the Electronic Book

For the past 500 years, the printed page has served as the basic and major means of storing and presenting information. The printed book has therefore become an everyday tool which most of us take for granted, and is used for many purposes, including education, religion, fiction, travel guidance, and leisure activities. In fact, many homes and offices boast shelves crammed with books, very often reflecting the interests of the owner(s) or occupant(s). Some of the benefits of the printed book are represented by its portability and relatively low cost (Barker and Manji, 1988), its ease of use and universally recognisable interface (Catenazzi and Sommaruga, 1994).

Despite the obvious usefulness and universal nature of the printed book, however, the advent of microchip technology has caused the limitations of the printed book to be realised and brought to the fore. The development of electronic technologies such as the Internet and the introduction of hypertext and data storage media such as CD-ROM (Compact Disc Read Only Memory), has led to the evolution of the concept of the electronic book. This represents a significant new development, which can offer added value to the printed book through its potential for including other media in addition to text on its pages. The electronic book often adopts the metaphor of a printed book as its interface, as a method of exploiting the mental models and manipulation skills (Carroll et al, 1988) and the structural, physical and logical aspects associated with the printed book (Barker, 1997; Catenazzi and Sommaruga, 1994; Landoni et al, 1993). The electronic book can offer such added features as animation, sound, hypertext and quick searching facilities. These elements represent interactivity, which distinguishes the electronic book from its more static printed counterpart (Kafai and Soloway, 1994; Parham, 1995).
Chapter 1: Introduction to the Thesis

The origin of the term "electronic book" has been variously attributed to Adele Goldberg (1979) in Barker and Manji (1988) and to Andries van Dam (no reference given - approximate timescale late 1960s) in Reynolds and DeRose (1992). Indeed, Reynolds and DeRose maintain that the concept of the electronic book goes back to at least 1945, when Vannevar Bush (1945) postulated an imaginary system called the Memex, which could store large amounts of text and allowed users to index and organize information. Bush also suggested providing an easy way to make and reuse connections between texts, which leads many to see the Memex as an early forerunner of hypertext (Reynolds and DeRose, 1992). However, as noted by Cawkell (1999), Kay and Goldberg together (1977) are usually credited with the idea, embodied in their "landmark" concept of the Dynabook.

Detailed definitions of the electronic book will be discussed in Chapter 2, and a model of the electronic book appears below.

1.2 Thesis Terminology

There are various terms which will be used throughout the thesis, and these are defined below:

1.2.1 Electronic Book
A diagram of a model of the electronic book is shown below in Figure 1.1. A definition of an electronic book should include the medium on which it is presented (e.g. Internet, CD-ROM), the content (e.g. fiction, non fiction), the presentation (e.g. book metaphor, input and output devices) and the functionalities (e.g. audio, animation). These are the significant features of an electronic book, which operate independently by overlaying each other. So, for example, the same electronic book can be presented either on CD-ROM or via the Internet, and the many and various electronic books which are currently presented on CD-ROM offer differing functionalities, and so on.
Chapter 1: Introduction to the Thesis

The author's own perspective of the electronic book is the sort which up to now has typically been presented on CD-ROM. It should be noted that CD-ROM may have recently been dominant as a medium, but it is purely a container for the electronic book. It is further noted that CD-ROM is quickly becoming outdated, being replaced by the Internet as a popular and viable medium on which to present electronic books. The model does not, therefore, rely exclusively on being presented on the CD-ROM medium. With regard to content, this thesis has been particularly concerned with children's story books, as these lend themselves well to the electronic format. However, it is easy to recognize that any content found in a printed book would be acceptable in an electronic book. The interface will be influenced by the book metaphor, being close to the form of a book (looking similar to a book, and having pages, contents, indexes, etc.), with added functionalities such as audio (narration, sound effects and music), animation, hypertext to explain difficult/unknown words, the ability to re-read whole pages or individual
works, and games which are connected to the story in some way. This model makes use of a structure based on layers in order to ensure that the study is portable irrespective of the inevitable changes in technology.

1.2.2 CD-ROM (Compact Disc Read Only Memory)
CD-ROM is a computer-based information storage and retrieval medium based on laser-technology and a strong, highly resistant 4.75 inch diameter disk. It uses the same technology as the audio CD for recording and reading data, and can hold the equivalent of approximately 250,000 typewritten pages or 500 high-density floppy diskettes (Feather and Sturges, 1997).

1.2.3 Reader
A device for reading electronic books which has emerged from the improving technology of laptop computers or subnotebooks (McKenna, 1998). Readers could be considered to be a descendant of the less successful Sony Data Discman (Vinzant, 1998), and approach the ideal of the portable electronic book. There are three types of reader: handheld (computers such as Personal Digital Assistants (PDAs) and palmtops which can be used to read e-books), dedicated (designed solely for reading e-books) and desktop readers (software installed on a standard PC or laptop) (Ormes, 2001). It should be noted that each type of reader currently makes use of a different technical standard, which means that e-books are not universally accessible across all readers. The Open eBook Forum (2000) has recognised this problem, and is currently trying to develop a universal standard for e-books.

1.2.4 E-Book
The electronic texts which can be displayed on a reader (see above) are usually called an e-book or sometimes an eBook.

1.3 The Relationship Between Printed Books and Electronic Books
As is usual with any new medium, levels of acceptance of the electronic book have been variable, and its development has led to general fears about the fate of the existing medium, in this case the printed book. In a similar way to that in which the development and wide acceptance of television was seen as
a threat to the film industry, some critics fear that the electronic book will supersede its printed counterpart completely (Cox, 1997; Walsh, 1996 and Max, 1994). This issue will be discussed in Chapter 2 of the thesis at greater length.

Indeed, a factor which reduces the likelihood of electronic books replacing printed books is their general lack of success up to now. The possible reasons for this lack of acceptance are noted in Chapter 2 in terms of the various limitations of electronic books as compared to printed books (see Table 2.2). These include lack of portability, relatively high cost, problems of various screen attributes, difficulties of gaining access to the equipment required to read the book, poor design, little attention to the potential user and market, and so on.

1.4 Children Reading Printed Books

The major importance which has become attached to the printed word naturally brings with it a requirement to be able to read what has been written. The significance of literacy and the development of reading skills is not doubted. These issues have been reinforced by their becoming a priority for the current UK Government and being brought to the fore in the Government funded Year of Reading 1998-1999 (Elkin and Kinnell, 2000).

However, the rapid evolution of modern technologies such as film, television, and video has led to concerns about their effect on children. These new technologies have led to the emergence of a generation accustomed to experiencing other media in addition to print as part of everyday life. Often termed “the television generation,” these young people are said to be exposed to a large number of images. The result of this is the development of sophisticated levels of “visual literacy”, which is “the ability to find meaning in imagery” (Yenawine, 1997). This will be discussed further in Chapter 2 of the present thesis.

The concerns which have been expressed are related to the possibility that the concentration on images and the increase in visual literacy have affected our children's attention span and their desire to read. An example can be seen in James (1993) discussing recent attempts to condense English literature into extracts which “might hold the interest of 13-year-olds with an attention-span dictated by television”. This is further illustrated by Livingstone and Bovill
(1999) finding that the children involved in their survey see books as "old-fashioned, boring, frustrating, and on their way out ... Books, we were told ... are too long, take too much effort ... They have too many words and don’t get to the point, the action is too slow, and there are no pictures." (Ch. 2 Pg. 17)

There is no doubt that television viewing is a significant part of children’s lives, as demonstrated by figures for the UK which state that, in 1998 46% of children (persons aged under 16) had a television and 14% had a video recorder in their bedroom (Fact File 2000, 1999). These figures are supported by Livingstone and Bovill’s (1999) survey carried out during 1997, which found that 63% of their respondents (aged 6-17 years) had a television and 21% had a video recorder in their bedroom. The television generation can also be called the “computer generation,” (Papert, 1993) since children use computers for many purposes, mostly for playing games, but also “to write, to draw, to communicate, to obtain information ... to establish social ties ... to isolate themselves” (Papert, 1993). In fact, children are becoming so familiar with computers that it is often observed that many of them are more conversant with computers than are their parents (Meek, 1991; Bromley, 1996).

1.5 Children Reading Electronic Books

As a result of the decreasing interest in reading and the 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. Indeed, increasing emphasis is now being placed on the electronic environment in teaching methods, particularly with regard to reading (Chu, 1995).

It might be argued that the electronic book is of relevance here. The electronic book represents the combination of the advantages of the printed book with the capabilities of the computer. As a result, the electronic 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 on its pages. Therefore, the electronic book adds more to the text and pictures in terms of animation, sounds, and a narrator (Kafai and Soloway, 1994), which may render the electronic book 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 (Jacobson, 1992; Chu, 1994; and Meakin, 1997).

1.6 Aims of the Thesis

The aims of the thesis are as follows:

- to investigate the relationship between the printed book and its electronic counterpart
- to explore children's interaction with and comprehension of electronic books
- to investigate other issues relating to young readers, including the nature of classic texts and encouraging reading
- to consider the question of author popularity, and how knowing more about this subject might help in the production of successful electronic books
- to examine the current role played by parents and schools with regard to the availability of electronic books to children
- to investigate the current and future role of electronic books within the principal suppliers of books to children (i.e. children's libraries and smaller book shops)

1.7 Summary of the Thesis

This thesis takes the electronic book as its main theme, and puts particular emphasis on its relevance to children. It begins with a review of the literature relating to electronic books, and any supplementary issues pertinent to the themes covered by the thesis. There is currently a generally held view that children are no longer reading as much as they used to. As a result of the decreasing interest in reading and the 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. The electronic book, representing the
combination of the advantages of the printed book with the capabilities of the computer may be 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. However, there is no evidence that they do indeed have this ability, and a discussion of this issue begins the thesis. A prime example of books which children are not reading, but which many in society believe that they should be reading is represented by classic texts. Nevertheless, there currently exists a large number of electronic versions of classics, and these are investigated as a type of electronic book which might play a part in encouraging children to read.

Classic texts are a good example of a genre which many believe that children should be reading, but which in reality they generally do not enjoy. An investigation of what makes children enjoy those books which they do like to read would be of use. Roald Dahl is taken as an example of a writer whose children’s books are extremely popular, and a study investigates the reasons for his success in the words of young readers themselves. Identifying what children like about a certain author would enable the incorporation of the desired elements into electronic books thereby encouraging children to read such books.

If we do encourage children to read electronic books, what effect might this have on their reading, and in particular on their comprehension of the book? Concerns have been expressed about the effect of the electronic medium on children’s comprehension of electronic books. This issue is investigated in a study of user interaction with electronic books which compares children reading an electronic text with children reading the same text in two different printed formats.

If children read electronic books, where will they get them from? A consideration of the principal suppliers of books and whether and how they are embracing electronic books is included. Lastly, parents and schools have an interest in children using electronic books. A search for existing surveys and studies of computer equipment in homes, schools and public libraries has been carried out in order to establish the level of access which children are likely to have to computer equipment at home, at school and in public libraries.
The final chapter discusses the global results and conclusions of the thesis. It includes considerations of the following subjects as encountered during the course of the research described in the current thesis: the advantages and limitations of electronic books; the book metaphor; electronic books and children; equipment for reading electronic books in schools, public libraries and at home; and the position of the major suppliers of electronic books. There then follows a discussion of how the hypotheses introduced in this Chapter have been proved and supported by the various studies in the thesis. Some global conclusions are drawn and some recommendations for future work are made.

1.8 Hypotheses

In exploring the relationship between the electronic book and the printed book, it was found that there exists a general belief that electronic books and printed books can and will exist alongside one another.

1. Electronic books have the ability to encourage children to read more
   - The electronic book adds more to the text and pictures which may render it attractive to children, particularly those for whom visual literacy has become very significant
   - Electronic books may have the power to bridge the gap between print and other media, and thereby encourage children to read more printed and electronic books
   - The electronic medium might encourage children to read more classics, a genre which is not currently a popular type of reading material amongst children
   - Identifying the elements which make an author popular would mean these could be incorporated into electronic books to make them more desirable as reading material

2. The medium on which a book is presented affects the reader’s comprehension of it
   - Reading the electronic book will affect children’s comprehension of the story as compared with reading the printed book

3. The embracing of the technology of electronic books is having an effect on the principal book suppliers, notably public libraries and booksellers
4. Parents and schools have a role in making electronic books available to children
   - The provision of equipment on which to read electronic books is one way in which parents and schools may influence children having the ability to read them
   - It should be possible to determine the level of access which children have to electronic books via the variety of literature which exists detailing the amount of homes, schools and public libraries which are providing the equipment on which to read electronic books

1.9 Thesis Structure

The following diagram illustrates the structure of the thesis.

![Diagram illustrating thesis structure]

Figure 1.2: Thesis structure

Figure 1.2 shows that the relationship between the electronic book and the paper book is at the heart of the thesis. Impacting on this relationship is the need to encourage children to read, which is of great significance within the wider context of the thesis. The main issues which have an impact on the relationship between the electronic book and the paper book are also shown in the diagram. These are the readers (in this case children), libraries, schools and parents, and publishers. The studies which have emanated from each issue are listed to the right of it in the diagram.
Chapter 1: Introduction to the Thesis

There now follows a review of the literature relating to electronic books and any supplementary issues pertinent to the themes covered by the thesis.
Chapter 2: Literature Review: The relationship between printed books and electronic books

(Adams, 1979 p44)

2.1 Introduction

There are various issues surrounding the subject of electronic books, and an extensive review of the literature dealing with these has been carried out. This Chapter provides a critique of the literature thought to be most relevant to the current thesis. It incorporates various issues which are continuing themes within the literature, and these are as follows: comparisons of electronic books with printed books; the book metaphor; and the ability of electronic books to replace printed books. A very new development which has emerged since the current research was instigated is represented by the "e-book", and the literature on this has been reviewed. The most detailed description will be of the literature appertaining to children and electronic books, as this issue is at the centre of the thesis. The remainder of the Chapter will address the theme of two major suppliers of electronic books, these being book shops and libraries. In addition to these, it is clear that the publishing sector has a great interest in electronic books. Many of the problems faced by the publishers in "... a business turned upside down by technology" and their effects on books (both printed and electronic) are discussed by Engelhardt (1997). A study of publishers was not possible within the constraints of the present research, but readers are advised to consult a comprehensive survey of publishers by Leaver (1995). Other noteworthy research includes that which has shown that electronic books are more economic for publishers to produce than paper ones, and that optical storage discs are cheaper to distribute than printed volumes (Clark, 1995).
2.2 Definitions of the Electronic Book

There are many different interpretations of definitions and concepts of electronic books within the literature. Below are listed some characteristic examples of definitions of the term “electronic book” which were highlighted by the literature review:

"Interactive live documents that you can create and read on a computer"

(Reynolds and DeRose, 1992 p 263)

"... an electronic communication that can be used in many of the same ways that a book can be used ... the merit of an electronic book is that it can be used in a variety of additional, value-added ways unavailable in comparable print publications"

(Griffith, 1995 p 10)

"... a collection of reactive (screen-based) pages of electronic information that are (usually) organized in a thematic way and that exhibit many of the characteristic features and properties of a conventional book ..."

(Barker, 1997 p 124)

"... a text analogous to a book, that is in digital form to be displayed on a computer screen ..."

(Feather and Sturges, 1997 p 130)

Landoni et al (1993) summarise four attempts at classifications of electronic books. The first of these is Collis (1991), who splits electronic books into two types of application - reference and text books. Reference books are considered by many writers and researchers to be highly suitable for the electronic format (Rawlinson, 1992; Kenner, 1993; Eco, 1995) due mainly to the advantages of electronic search tools. This also includes handheld, stand-alone analogues, such as electronic spellcheckers, dictionaries, etc. (Feldman, 1990). Text books, that is, books used for the purposes of education, are also considered to be highly suitable for the electronic format, due mainly to the advantages of interaction (Retterer, 1991; Klebnikov, 1995).

It is evident from the literature that there are other applications which can be added to the list. Children’s books are considered by many writers and researchers to be very suitable for the electronic format, due mainly to
interactivity (Kafai and Soloway, 1994; Roffey, 1995; Klebnikov, 1995; Parham, 1995). With regard to literature, there is much debate over the suitability for the electronic format of prose and poetry in particular (Lillington, 1997; Eco, 1995; Lu, 1993; Kenner, 1993; Jackson, 1992). As an example, Pack (1994) suggests that the electronic format interferes with the relationship that the reader should have with the text. Nevertheless, prose and poetry are increasingly found as online texts which are available over the Internet, e.g. Project Gutenberg (Hart, 1990), and the potentialities of hypertext fiction are discussed by Coover (1992). Drama, however, is thought to be more suitable for the electronic format, since multimedia can offer such elements as performance examples and background information. Rare and/or old manuscripts are considered to be very suitable for the electronic format, because this can help to save the originals from further damage, and for the purpose of easier text manipulation (Goodman, 1993; Katz, 1993). Examples include the Electronic Beowulf (Kiernan, 1995) and the electronic version of the Domesday Book (Palmer, 1986).

A criterion believed to be important by Landoni et al (1993) in the classification of electronic books is the type of presentation employed in the realisation of the book. Various categories are discussed, which are not necessarily exclusive, and liable to overlap. These are portable electronic books, which aim to reproduce the portability of a printed book; those which preserve the logical structure of printed books (e.g. organisation of book in chapters, sections, etc.); and those which preserve the physical and logical aspects (e.g. pages, book thickness).

Landoni et al quote Barker (1991 and 1992) offering two taxonomies of the electronic book, the first of which is based on the type of information which is embedded in the electronic book. Barker suggests the following categories:

1) archival, that is, offering large volumes of information relating to a particular subject area
2) informational, that is, stored information which is less comprehensive and more specific than above, and relating to a particular topic area
3) instructional, that is, for the support of learning and training activities
4) interrogation, that is, for the support of testing, quizzing and assessment activities
Barker's (1992) second, more "fine-grained" taxonomy is based on both the type of information embedded in the book and the kind of facility made available within it. This classification is based on the format or interface of the book, and the categories offered are: text books, static picture books, moving picture books, talking books, multimedia books, polymedia books, hypermedia books, intelligent electronic books, telemedia electronic books, and cyberspace books.

The two taxonomies offered by Barker (1992) are clearly not concerned with the medium on which the system is published. Indeed, Barker states that both refer to an electronic book as being one which is published on "... a suitable interactive medium ... either magnetic or optical storage media". He does, however, allow that a classification might be based on the publishing medium. From the literature, these include audio (Hoffman, 1995), magnetic storage on diskette or tape (Barker, 1997), PCMCIA cards (Leaver, 1995) and media requiring special delivery equipment, e.g. Data Discman (Barker, 1997), Franklin's Digital Book (Feldman, 1993), and Personal Digital Assistants (PDAs) such as the Apple Newton (Godwin, 1993). Other examples of electronic books which may require special delivery equipment include Book Emulator (Benest, 1991), Ebook (Bennett, 1994; Savoy, 1989), Smart Book (Blake, 1988), Hyper-book (Catenazzi and Sommaruga, 1994), SuperBook (Egan et al, 1989), Hyperties (Kreitzberg, 1989; Shneiderman, 1987), and APTBook (Miyazawa et al, 1990). Currently rising in significance are handheld electronic books, for example, Softbook and Rocket eBook (Greenhalgh, 1998; Nielsen, 1998 - see Section 2.6 of the thesis) and books presented online via the Internet (e.g. Treasure Island (1997), the Stories from the Web project (Ormes, 1997) and Project Gutenberg (Mitchell, 1994)).

At the time when the bulk of the present research was carried out, however, a very dominant medium on which the electronic book was presented was CD-ROM (Meakin, 1997; Barker, 1997). It was the publishers' model (Weedon, 1996), and the definition of "electronic book" from the International Encyclopedia of Information and Library Science (Feather and Sturges, 1997) states that an electronic book will be presented on CD-ROM and "displayed on a computer screen". Furthermore, as an illustration of the continuing dominance of the medium in general terms at the present time, there are currently "over 16,000 CD-ROM titles" according to the directory CD-ROMs in Print (1999).
## 2.3 Electronic Books compared to Printed Books

The advantages and limitations of both printed books and the electronic form are discussed often in the literature, and naturally, some overlaps in ideas are encountered. In addition, there is likely to be some disagreement with the advantages and limitations, for example, the linear nature of conventional books is open to discussion (McKnight et. al., 1989). Developments in technology have also solved or are solving some of the limitations of electronic books, for example, problems of historical tracing and joint editing, and screen quality. Lack of portability in particular is being addressed in the form of dedicated e-book readers, which are more like printed books than any previous devices and approach the ideal of the portable electronic book (see Section 2.6 *E-Books and Dedicated E-Book Readers*). The principal advantages and limitations of both electronic and printed books which were found in the literature are summarised in Tables 2.1 and 2.2 below. It can be seen that a large number of these were found in the literature, and it should be noted that the relative importance of each was not widely addressed. It therefore remains to be seen whether the advantages will outweigh the limitations or vice versa.

<table>
<thead>
<tr>
<th>ADVANTAGE</th>
<th>Reference</th>
<th>LIMITATION</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>easy to produce</td>
<td>Miyazawa et al. (1990)</td>
<td>difficult to reproduce</td>
<td>Barker (1992)</td>
</tr>
<tr>
<td>relatively low cost</td>
<td></td>
<td>expensive to disseminate</td>
<td></td>
</tr>
<tr>
<td>easy to use</td>
<td></td>
<td>difficult to update</td>
<td></td>
</tr>
<tr>
<td>can be read in a comfortable position</td>
<td></td>
<td>single copies difficult to share</td>
<td></td>
</tr>
<tr>
<td>can highlight</td>
<td></td>
<td>easily damaged and vandalised</td>
<td></td>
</tr>
<tr>
<td>can be annotated</td>
<td></td>
<td>bulky to transport</td>
<td></td>
</tr>
<tr>
<td>thickness of book denotes length</td>
<td></td>
<td>unreactive and static content</td>
<td></td>
</tr>
<tr>
<td>pleasurable to handle</td>
<td>Nunberg (1993)</td>
<td>cannot use sound</td>
<td></td>
</tr>
<tr>
<td>embody particular texts</td>
<td></td>
<td>cannot include animation/moving</td>
<td></td>
</tr>
<tr>
<td>act as an inscription in space</td>
<td></td>
<td>pictures</td>
<td></td>
</tr>
<tr>
<td>surrounded by well-established</td>
<td>Catenazzi and Sommaruga (1994)</td>
<td>unable to monitor</td>
<td></td>
</tr>
<tr>
<td>conventions</td>
<td>Cawkell (1999)</td>
<td>reader's activity</td>
<td></td>
</tr>
<tr>
<td>good quality</td>
<td></td>
<td>cannot assess reader’s understanding</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>material cannot be adapted</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>dynamically</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.1: Advantages and limitations of printed books
The majority, if not all of the advantages and limitations of printed and electronic books noted above concentrate on the perspective of the end user. There are other stakeholders with an interest in books of all kinds who are likely to have significant views on this issue, for example, book shop managers and owners, librarians and publishers.

2.4 The Book Metaphor

The model for the electronic book might well be found in a well-known example from fiction (Adams, 1979):

"... a device which looked rather like a largish electronic calculator. This had about a hundred tiny flat press buttons and a screen about four inches square on which any one of a million 'pages' could be summoned at a moment's notice. It looked insanely complicated, and this was one of the reasons why the snug plastic cover it fitted into had the words DON'T PANIC printed on it in
large friendly letters. The other reason was that this device was in fact that most remarkable of all books ever to come out of the great publishing corporations of Ursa Minor – *The Hitch Hiker’s Guide to the Galaxy*. The reason why it was published in the form of a micro sub meson electronic component is that if it were printed in normal book form, an interstellar hitch hiker would require several inconveniently large buildings to carry it around in." (p 24)

The very term “electronic book” implies some link with the printed book, and this is particularly in evidence with regard to the book metaphor. This is an idea which refers to making use of the familiarity of the conventional book form to introduce the new concept of the electronic book, and can be recognised above in *The Hitch Hiker’s Guide to the Galaxy*. It involves using the existing mental models and manipulation skills associated with printed books in the design of electronic books (Carroll et al, 1988) in order to make them more usable by readers, and is a common theme throughout the literature (for example, Landoni and Gibb, 2000, Catenazzi and Gibb, 1995, Catenazzi and Sommaruga, 1994; Benest, 1991; Burrill and Ogden, 1989; Carroll et al, 1988; Desmarais, 1994; Erickson, 1990; Saffo, 1992). The printed book has a universal interface incorporating a logical structure (e.g. chapters and indexes) and physical and logical aspects (e.g. pages, book thickness analogies) (Landoni et al., 1993). Readers of the printed book have a commonly held prior knowledge of how it works (Catenazzi and Sommaruga, 1994; Barker, 1997) which maximises its usability (Landoni et al., 1993). It has therefore been argued that the use of the book metaphor would ensure that the electronic book remains as much like the printed book as possible and so maximises its own usability. As declared by Burrill and Ogden (1989), “The most obvious model for the interface to a computerized book is its paper counterpart” (p144). The general concept of interface metaphors is widely recognised, for example, Erickson (1990) and Carroll et al. (1988).

Researchers have suggested that, in order to produce the most effective electronic book, attempts should be made to identify all the advantages and disadvantages of the printed book. By retaining the advantages, eradicating the disadvantages, and incorporating the benefits of the electronic medium (e.g. interactivity, animation, sound, connectivity, customisability and rapid
information retrieval), an efficient electronic book can be developed (Catenazzi et al, 1993; Benest, 1991). Indeed, it has been suggested that this mixture is the only "genuine" electronic book (Nunberg, 1993). The importance of presenting information in an electronic book in a “natural and user-friendly way” has been stressed by Catenazzi et al (1993) whose visual book environment aims to offer the reader an object as similar as possible to the paper book, reproducing its most useful and familiar features in an electronic environment. The benefits of the book metaphor have been demonstrated by the favourable results which have been obtained from an evaluation of the visual book (Landoni and Gibb, 2000).

This concept is taken further with the proposition that the electronic book can only become widely accepted if it can offer the same properties as the conventional book, for example, rendering the computer screen as readable as paper (Landoni et al, 1993), and making electronic books as portable as conventional books (Goodman, 1993). Indeed, the importance of portability has been stressed by numerous writers (e.g. Cawkell, 1999; Vizard, 1997; Bryant, 1995; Landoni et al, 1993; Hatvany and Lukey, 1990), with Stonier (1991) taking this to its extreme, suggesting that one day practically everyone will own a pocket-book sized computer which will become “the ultimate in electronic books” (p 364). Such concerns involve the problems of hardware and software development (Landoni et al, 1993), of which a large part are now being addressed by the appropriate advances in technology (Collier, 1993 and see Section 2.6 E-Books and Dedicated E-Book Readers). Printed books are essentially linear in nature, and electronic books, particularly those involving hypermedia, take account of network structures and are therefore less linear in nature. This difference can lead to a certain degree of breaking down of the book metaphor during user control and navigation within hypermedia electronic books, due mainly to non-linear access being incompatible with some of the elements of the book components, for example, page numbers (Richards, 1994). Richards sees an absence of research into the effectiveness of adopting the book metaphor in design, and having tested the concept, he finds it useful in the design of electronic books, and worthy of further investigation.

Naturally, there are objections to the use of the book metaphor. It could be argued that enhancing the printed book with electronic features changes it into something other than a book. Therefore, some critics have expressed the opinion that the electronic book should not really be described as a book at
all, considering it to be “something new” (Saffo, 1992). Barker et al. (1994) note that enhancing electronic books makes them “bear little resemblance to ... conventional books”, although they do share many of the same logical and organisational features, which can be seen as an aid to end-user control and navigation within electronic texts. Indeed, it has been suggested that the durability of the electronic book metaphor is doubtful considering that electronic books may be different from printed books in their physical and psychological approaches to the holding and examination of information (Worlock, 1994).

2.5 Electronic Books Replacing Printed Books

The possibility of the development of effective electronic books such as those described above has led to general fears about the fate of the printed book (see the Introduction to the thesis). Amid worries that the electronic book will supersede its printed counterpart completely, “The End of Books” has been predicted by two writers - Kurzweil (1992a) and Coover (1992). Discussions of this issue abound, with titles such as “On the Future of the Book, or Does it Have a Future?” (Meadow, 1995), “Have We Reached the End of the Book?” (Walsh, 1996), and “Taking Sides on the Future of the Book” (Cox, 1997).

Some writers do envisage electronic books bringing about the end of the printed book. Hatvany and Lukey (1990) believed that this would happen “rapidly”, causing “fantastic changes” to happen in the library world. Kurzweil (1992a) foresees that paper books will be rendered obsolete by the ability of computers in the early 21st century to match the essential qualities of paper and ink. He states “The book will enter obsolescence, although because of its long history and enormous installed base, it will linger for a couple of decades before reaching antiquity” (p 141). Max (1994) argues that the book will become the equivalent of the horse after the invention of the car or the LP after the invention of the compact disc, “a thing for eccentrics, hobbyists, and historians”. Lande (1991) accepts that electronic books cannot replace the “... pleasures of book covers and pages to turn” and sees existing an emotional relationship with print. However, he believes that over time, the electronic book will gain reader acceptance, particularly with the “Nintendo generation”, and will become increasingly standard. The suggestion is being made, therefore, that the printed book will eventually become obsolete.
Despite some writers expressing this view, however, the bulk of opinion in the papers found by the literature review is that the electronic book is unlikely to supersede the conventional book completely (for example, Cawkell, 1999; Jackson, 1992). Indeed, the prevailing view is that it should be possible to retain both the printed and electronic form of book (for example, Eco, 1995). Eco considers that historically, in the relationship between old and new technology, "... it has never happened that something has simply killed something else. Something has only profoundly changed something else" (p 4). Goodman (1993) is in agreement, stating that the electronic book will have a similar impact on the printed book that television had on radio. That is, the electronic book will discover its own "niche in the publishing world", with its own "purposes and clientele, separate but complementary to the traditional book" (p 10).

There are various reasons put forward for the inability of the electronic book to replace its printed counterpart. Many of these concern either the advantages of the printed book or the disadvantages of the electronic book (see section 2.3 Electronic Books compared to Printed Books). The printed book is described as being inexpensive, convenient (Goodman, 1993), private and portable (Children's Literature Research Centre, 1996), and therefore good for reading in bed or in the bath (Burrill and Ogden, 1989). The printed book is familiar, with its "friendly" appearance, "curled edges and worn spine" (Cox, 1997), and so has a physicality which computers do not have (Nunberg, 1993). Indeed, it is even said that computers are not as physiologically and aesthetically pleasing as paper (Valauskas, 1994). The printed book is easy to view and has very low power requirements (Vizard, 1997). These are features which the majority of electronic books presently do not have. It is also thought that printed books will prove to be durable because there are very many people who like printed books (Eco, 1996), perhaps even going so far as to have an honest appreciation for the book as an art form (Goodman, 1993). A study of children’s reading habits (Children’s Literature Research Centre, 1996) has found evidence that printed books are necessary to the young person’s reading imagination in a way in which electronic books are not. It has also been suggested that books and magazines are irreplaceable for the market testing of ideas and stories (Klebnikov, 1995).

It has been argued that people prefer reading paper to reading screens (Economist, 1998; Valauskas, 1994). There are various reasons for this, including the necessity of sitting in a fixed position to read desktop screens,
and laptop displays not being as portable as paper, having limited viewing angles. The contrast, brightness and resolution of text on a screen is not as readable as many people think, and this explains, at least in part, why people often choose to read on paper instead. As noted by Nielsen (1998), all ("low-resolution") computer screens up until now have been victim to "poor readability: people read about 25% slower from computer screens than from printed paper ". Computer screens have a landscape orientation, while most printed and written reading materials are portrait-oriented. Experiments carried out in 1997 and 1998 have shown a preference for portrait orientation and for two-page spreads (Economist, 1998). Books and computers are not read in the same way (Valauskas, 1994) and for those people who just want to read, an electronic book is unsuitable because their interest in manipulating text stops at being able to sit somewhere and turn the pages (Nunberg, 1993). A very significant problem with electronic books, which will be discussed in greater detail later in the present thesis, is that the technology required to read them is not sufficiently widespread among the general population (Eco, 1996). A difficulty has been foreseen in transferring the great amount of printed material already existing on to the electronic format (Goodman, 1993). Furthermore, it has been pointed out that the long-lasting technology of the printed book is not paralleled in the electronic medium (Eco, 1996), so that a particular technology might become obsolete, rendering unreadable the printed material which has been transferred on to it.

### 2.6 E-Books and Dedicated E-Book Readers

Since the current research began, a new type of electronic book has emerged from the concept of "subnotebooks" (McKenna, 1998). As the prices of components of laptop computers have fallen, they have been "repackaged" as devices for reading electronic books. These are usually referred to as dedicated readers, and the texts which they are used to read are being called "e-books" (Vinzant, 1998). As discussed in Chapter 1, these are one of the three types of reader: handheld, dedicated and desktop (Ormes, 2001). A descendant of the less successful Sony Data Discman (Vinzant, 1998), the dedicated readers which are available are currently produced only in the USA, although they can be obtained in this country over the Internet. These are more like printed books than any previous devices and approach the ideal of the portable electronic book. Presently the leading example of the reader appears to be the RocketBook (Nuvomedia, 2000). Launched by the American poet laureate
Robert Pinsky (Scholarly Communications Report, 1998), the RocketBook is reckoned to be "...one of the two of the electronic book projects most likely to succeed" (McKenna, 1998 p 347). Figure 2.1 is a picture of the RocketBook, which first went on sale in November 1998, and which has been described as follows:

"...the size and weight of a largish paperback, with a portrait-shaped screen and no scrolling text. The display is close to paper-white and has a higher resolution than most computers (106 pixels per inch). It can be read from almost as many angles as paper, so it can be used with equal ease while walking, lying on a sofa, sitting at a desk or on the proverbial lavatory. Readers turn whole pages at a time with thumb-buttons beside the screen."

(Economist, 1998 p 152)

The situation with regard to electronic book readers is currently very dynamic. A useful source of the latest information pertaining to all aspects of this subject is the Open eBook Forum (2000). Of particular note are the continuing attempts by the Forum to develop a universal e-book standard (see Chapter 1). Other examples of readers are the Softbook (Softbook Press, 2000; Dorman, 1999; Economist, 1998) which is the other of the two projects believed most likely to succeed (McKenna, 1998), the Librius Millennium
Chapter 2: Literature Review


RocketBook works by purchasing the unit and then buying electronic texts over the Internet for instant downloading to a computer. Texts can be stored in the computer for whenever they are required to be loaded into the RocketBook itself (Vinzant, 1998). It is around the size of a standard paperback and weighs 22oz (Greenhalgh, 1998). Softbook works by plugging the reader into a phone line and dialling the Softbook download server. A monthly subscription of around $20 must be paid, and this is credited towards any text purchases (Robb, 1998). Softbook measures 8.5in by 11in and weighs 3lb (Greenhalgh, 1998). Glassbook is a downloadable software program which can be used on any Windows compatible PC. It is therefore only portable if read on a laptop or notebook. The program is free, and then electronic texts are bought and downloaded using the Internet. Further features are offered by a more advanced version of the program which must be purchased (Glassbook Inc., 2000). Librius works by downloading books from the company’s web site on to a PC or Macintosh computer. About the same size as a paperback book, it weight less than 1lb (Greenhalgh, 1998). Everybook EB Dedicated™ Reader is the only device to utilise the format of two portrait-oriented screens, which looks very similar to the layout of a book. It works by attaching the Reader to a phone line in order to connect to the Everybook Store. This is a virtual reality book shop which appears across the two screens of the Reader. The book shop can be browsed until purchases are made and can be downloaded into the Reader immediately, or at a later and less expensive time (Everybook Press, 2000). The two full-page screens are 8in by 10.5in each, and the unit weighs 3.7lb (Greenhalgh, 1998).

The advantages of dedicated reading devices are that they allow readers to customise the screen and text, make margin notes, underline text, set bookmarks and search the contents (Finn, 1999). Some readers also allow readers to look up words in a dictionary (Vinzant, 1998). They are good for reading in the dark and on the move (Economist, 1998) and for ensuring that books do not go out of print (Vinzant, 1998).
Although claims are being made for these reading devices becoming increasingly similar to their printed counterparts, some shortcomings which relate to aspects of the printed book have been emphasised. The fact that people are physical beings and like the physicality of books and browsing is not addressed by the reader (Finn, 1999; Economist, 1998). Indeed, Finn (1999) cannot perceive that reading the e-book will be the same single, pleasurable activity as reading the printed book, and bemoans the lack of immediately visible page numbers. Nielsen (1998) finds that the screen resolution of readers is not yet good enough, and suggests that these devices should not be using the book as a metaphor. He suggests that the book is too strong a metaphor and that electronic text should be based on “interaction, hypertext linking, navigation, search, and corrections to online services and continuous updates”. Nielsen thinks that information should be dynamic and under direct control of the reader rather than the author.

Security problems have been envisaged whereby more unscrupulous readers could illegally copy texts. The answer to this difficulty has been encryption, although this is thought to be problematic in the typical open network environment of e-books (Greenhalgh, 1998). As explained by Bill Gates (1999) of Microsoft, the issue of compatibility is being addressed by various companies (which include e-book pioneers and publishing firms) uniting to create an open e-book standard. The aim of the standard is to ensure that readers will eventually be able to read any title on any reading device. Indeed, the Microsoft company is just one of the many organisations which make up a group working on the open e-book standard (Open eBook Forum, 2000), and is likely to have an interest through their recently released device, Microsoft Reader (Microsoft, 2000).

It has been suggested that the success of electronic readers will depend on the price and availability of content (Economist, 1998). Indeed, it is noted that there is a current lack of available titles for readers (Finn, 1999), however, this is likely to be remedied in the future. An intimation that “e-books can sell in large quantities” (Bookseller, 2000) came when the novella Riding the Bullet (King, 2000) was released exclusively in electronic form. The story sold 400,000 copies within the first 30 hours of becoming available, and is believed to have earned about £300,000 for its author, Stephen King (Bookseller, 2000). This illustrates that perhaps the involvement of popular writers may contribute greatly to the acceptance of e-books. The market which is currently being targeted for the sale of e-books encompasses professionals who do a lot
of reading on the move (McKenna, 1998) and students, academics and "professionals who have required reading" (Vinzant, 1998).

Although it has been suggested that simple downloading of e-books might pose a real threat to the roles of traditional publisher, retailers and libraries (Dorman, 1999; Scholarly Communications Report, 1998), it is also felt that the electronic reader is most unlikely to kill off its printed ancestor, rather existing alongside it (Economist, 1998).

2.7 CD-ROM

As discussed in the Introduction to the thesis, electronic books delivered via the Internet are rising in popularity. However, since this thesis concentrates essentially on the medium of CD-ROM (Compact Disc Read Only Memory), it is not thought necessary to include an investigation of the literature on Internet books in great depth. Furthermore, this is a fairly extensive and ever expanding subject, and so the scope of the current thesis would not sustain a comprehensive exploration of the relevant literature.

The great flexibility of CD-ROM technology allows it to store large amounts of information (Lambie, 1994), including written, and more particularly audio and visual material (Shaw, 1991). The medium was becoming popular in the early to mid 1990s (Eidinow, 1994), although at least one writer considered them to be "somewhat unwieldy" (Worlock, p 234). As the CD-ROM drive became a standard feature of new personal computers, CD-ROMs themselves grew cheaper to buy (Economist, 1994). At the present time, CD-ROM remains a popular medium on which to present an electronic book (Meakin, 1997; Barker, 1997). It is explicitly named in the definition of the phrase "electronic book" in the International Encyclopedia of Information and Library Science (Feather and Sturges, 1997) and is the publishers' model (Weedon, 1996) (see the Introduction to the thesis). However, an indication that CD-ROM has not lived up to initial expectations came with the news that several publishers - Dorling Kindersley, News Multimedia, McGraw-Hill and Quarto - were scaling down their multimedia operations (Newman, 1997; Reguly, 1996).
2.8 Children and Electronic Books

Due mainly to the possibilities offered to children by their interactivity, books for children have been considered by many writers and researchers to be very suitable for the electronic format (Kafai and Soloway, 1994; Roffey, 1995; Klebnikov, 1995; Parham, 1995). Indeed, together with reference books (Cawkell, 1999; Lyall, 1994; Milne, 1994; Jackson, 1992), children's story books have been amongst the more successful books in the electronic format (Klebnikov, 1995; Meakin, 1997). Examples of more popular children's electronic books are Arthur's Birthday (Bröderbund Living Books), Arthur's Birthday (Bröderbund Living Books) and Sitting on the Farm (Sanctuary Woods I Learn Series). A consideration of children as users of electronic books will therefore make up part of this thesis.

2.8.1 Visual literacy

The Introduction to the thesis has already introduced the idea that there are high levels of “visual literacy” amongst today’s children, which may be affecting both their attention span and their desire to read. Visual literacy is “the ability to find meaning in imagery” (Yenawine, 1997). As further elucidated by Yenawine (1997), constructing meaning from the enormous variety of images present in contemporary culture calls upon a variety of different skills. For example, “a straightforward news photo requires fewer, simpler operations than a psychologically manipulative ad (and) an illustration engages the viewer differently from abstract painting ...” (Yenawine, 1997 p 845). The combination of these skills is called “visual literacy”, or sometimes “media literacy” (Desmond, 1997). Yenawine points out that there are degrees of visual literacy, quoting the example of a young person being able to construct meaning from both simple and complex visual materials, compared to an older person gleaning more possibilities from the same images by way of a greater experience and breadth of thinking skills in general.

The predominance of, and children's great interest in the visual media such as video, audio, comics and magazines, film, television and computers is said to be causing them to develop a more sophisticated level of visual literacy than they might formerly have done. The result of the increasing significance of
visual literacy is that more importance is being placed on extending the definition of literacy to include the reading of electronic formats (Meek, 1991; Adams, 1986). Furthermore, Dresang (1997) has noted the "substantial" influence which the digital world is having on printed literature for young people. Extending well beyond materials produced in electronic formats, she sees this transformation of form and content in the arena of texts for children as being natural and inevitable in an increasingly electronic society.

### 2.8.2 The decline in reading amongst children

However, it is often suggested that children's interest in reading is in decline, and the increasing dominance of the more visual media, particularly among young people, is cited as the main cause. The very suggestion that reading is decreasing in popularity with young people has been tested by various surveys of reading in the last few years. For example, Benton (1995a) surveyed a representative sample of 789 year 8 pupils (aged 12-13 years) in one shire county of southern central England. This was a questionnaire survey modelled on an earlier study by Whitehead et. al. (1977), which Benton calls "... the single most comprehensive study of children's voluntary reading" in the previous 25 years. Bearing in mind the relatively small numbers involved and the sample being representative of one single county, the study offers some useful pointers to what "the young of 'middle England' are reading ... by choice." (p 102). Benton's findings suggest that, among the participants to the study, there has been no great decline in the reading of fiction overall. He does, however, note a downward trend since 1977 in the amount of fiction being read by the boys, and a slight increase in the amount being read by the girls.

Hall and Coles (1999) set out to investigate children's choices of leisure reading matter. Their study took place in 1994/95, and involved a questionnaire survey of nearly 8,000 10, 12, and 14 year old children across England. This was followed up with discussions with interested parties, i.e. children, teachers, researchers and educationalists. In common with Benton (1995a - discussed above), this was intended to repeat the work carried out by Whitehead et. al. (1977). From the data obtained about the number of books which had been read by participants in their leisure time during the four weeks previous to the survey, it did not seem that the many other distractions on offer to children in the 1990s (but not in the 1970s) had led to an overall
decline in the amount of book reading achieved since the Whitehead study. In addition, approximately 65% of participants viewed reading in a positive light, and around 96% owned their own books.

In early 1995, a study by the Children’s Literature Research Centre (1996) surveyed approximately 8,800 children aged between 4 and 16 and living in England. It was found that over half the children questioned in all age groups (except boys aged 14 to 16 years) read fiction “often” or “very often” (from a five-point scale “very often”, “often”, “sometimes”, “hardly ever”, “never”). However, this does not refer to reading that is done only at home. Participants were therefore also asked about their out of school and after school activities, and it was clear from the responses that those who spent most time reading were also those who were busiest across the range of activities, including watching television and videos and using a computer. The authors note that their findings suggest that the corollary to this is not true, that is, those who do not watch a great deal of television are not necessarily active readers.

Indeed, the reputed link between the rise of new technologies, and the perceived decrease in reading has been investigated as part of both Benton (1995a) and the Children’s Literature Research Centre (1996) described above. Hall and Coles (1999) noted that watching the television displaces time spent doing something else, and attempted to test the theory that reading was the activity being superseded. To this end, participants were asked how much television they had watched on the evening prior to the survey, and it was found that children generally reported spending significantly more time watching television than reading. Furthermore, “heavy” readers were more likely than others to have watched no television the previous evening, and an inverse relationship between the amount of television viewing and the amount of book reading was generally the case in this survey. However, the authors found that this relationship is not as simple as it may appear, and some children “manage to accommodate a considerable amount of television viewing and a considerable amount of reading in their leisure time activities.” (p 125) This last finding agrees with that of the Children’s Literature Research Centre (1996).

As part of his survey of children’s leisure reading habits, Benton (1995a) discusses the theory that television in particular is displacing reading, and finds it likely that there is an increasing link between reading and viewing.
He notes that the result of the growth in the amount of television and video machines situated in children's bedrooms has been that children now have a far greater level of control over their viewing than formerly. He is also concerned about the view that boys are reading less than girls as a result of the former's increasing interest in computer games, and indeed found a greater interest in computer games among the boys than among the girls.

Hall and Coles (1999) also studied current concerns about the relationship between reading and the use of computers. To this end, participants were asked about their computer use on the evening prior to the survey, and 44.5% reported some such use. No significant relationship was found between the participants' reported use of a computer and whether or not they had been reading that same evening. The findings did not suggest that using a computer has any notably adverse effects on children's reading.

A study of the reading habits and attitudes of both adults and children (Book Marketing Ltd, 2000) involved a postal survey among a nationally representative sample of approximately 1,000 British households (2,500 adults and children). Amongst many other issues, the survey investigated the reasons why respondents either did not read books, or did so only occasionally. The survey found that 17% of the children (aged up to 16 years) who answered the question gave the reason that they used electronic media instead. Notably, this was twice as many as the number of adults who mentioned using electronic media instead of reading books.

The amount of books being bought by and for children might also be considered to be an indicator of the popularity of reading. In both 1997 and 1998, purchases for children (persons aged 16 and under) accounted for 21% of all consumer expenditure on books across both years (Book Facts 1999: An Annual Compendium, 2000). The data include purchases by children themselves, and although it is difficult to be sure that children read all the books which they buy or which are bought for them, this can be seen as a useful indicator that the popularity of books is not declining. Similar figures for 1994 (Book Facts 1995: An Annual Compendium, 1996) show that 29% of consumer books were bought for children at that time. Although the data collection was not exactly the same - the 1994 figure does not include purchases by children themselves - this does seem to reinforce the notion that the amount of books being bought for children is not decreasing. However, the situation appears to be different with regard to borrowing from libraries.
Chapter 2: Literature Review

The most recent annual survey carried out by LISU of public library services to children in the UK (Creaser, 1999) found that the number of issues of books to children in public libraries is declining. It is also once again difficult to be sure that children read all the books which they borrow or which are borrowed for them. It is also worth noting that audio visual issues (including CD-ROM) to children from public libraries are rising (Creaser, 1999).

2.8.3 The range of media available to children

In a paper relating to the same study, but following up from the one discussed above, Benton (1995b) concludes that reading is not necessarily in decline, but that the type of literature which is being read is changing along with the times. If this is true, it is likely that electronic books will be one of the new types of literature which will increase in popularity. Furthermore, Hall and Coles (1999) conclude that the television and the computer should not be seen in opposition to the book, but that each should be seen as one element in the range of media available to children of the present time. Their findings, and those of other research, support the position that, "... children, on the whole, do not consider their use of different media in a hierarchical relationship with one another either in relation to the use of their spare time, or the satisfactions they gain." (p132-133) Hall and Coles believe that children who have grown up with television can integrate the extensive use of it into their lives without having to exclude other activities.

A major and comprehensive study investigating how children combine television and other "new media" (cable/satellite television, the personal computer, the CD-ROM, TV-linked games machines, the Internet and e-mail) in their daily life was carried out during 1997 (Livingstone and Bovill, 1999). This was a survey of 1300 children using a detailed questionnaire administered through an interview in the home, and had various research aims, the most relevant being; to chart current access and use for new media at home; to provide a comprehensive account of domestic leisure and media activities; and to understand the meaning of the changing media environment for children and parents.

The overall impression which the authors received from their study was of young people constructing and maintaining a "varied leisure mix which spans both media and face-to-face interaction, indoor and outdoor activities,
Chapter 2: Literature Review

time with friends, time with family and time alone." (p9). They found that young people spend approximately five hours a day with media, and that the new media which are emerging appear to be displacing non-media pursuits, rather than other media. However, there was one notable exception in that those participants who spent longer reading books were watching less television, which agrees with the findings of the survey by Hall and Coles (1999) discussed above. However, unlike the other survey, Livingstone and Bovill (1999) found that this worked the other way, that is, those who spent longer watching television were spending less time reading books.

Indeed, Livingstone and Bovill (1999) found that, on average, participants spent five times as long each day watching television as they spent reading books. It was interesting that the parents who were interviewed were not always happy about this distribution of time, and that the children were well aware of their feelings. The survey found that fewer homes have books than have television sets, and even allowing for the discrepancy in cost, "... no more children own books (two-thirds in all) than have their own television set." (p 23) The appeal of computers and other media to children was in evidence from the authors' conclusion that the position of books in children's lives is changing, threatened by IT as a source of information, and by television as a source of narrative. The suggestion that printed books are in decline compared to the visual media was reinforced by the study's findings with regard to the image of books. The overall image of books was poor, and they were widely considered to be "... boring, old-fashioned, frustrating and as requiring altogether too much effort." Because they are "'what your parents approve of'", books are not "trendy" (p 23). However, perhaps more encouragingly, the survey did find that many of the participants enjoyed books despite this poor image. Fifty seven per cent of respondents read books that were not for school, and on average they spent just under an hour reading on 3 to 4 days a week. A fair proportion of readers (30%) spent almost an hour a day reading books. The possibility is noted, however, that children might have been giving what they felt to be the desired response. That is, because books are approved of by parents and other adults, they are aware that adults believe they should be reading books.
2.8.4 Electronic books and reading

Whether or not there is a decreasing interest in reading among children, it is evident that the electronic environment is becoming more important to most children, and perhaps particularly those who do not respond well to traditional print media. It is clear that reluctant readers do exist (see, for example, Children's Literature Research Centre, 1996; Livingstone and Bovill, 1999) and it may be that electronic books can interest them in reading. Indeed, the greater use that is being made of computers in schools, and the increasing emphasis being placed on the electronic environment in the teaching of reading (Chu, 1995) may be an indicator of the part which computer technology might play in reading.

The electronic book incorporates the print medium with visual media. That is, it offers an extra dimension to print by including media other than text on its pages, adding more to the text and pictures in terms of animation, sounds, and a narrator (Kafai and Soloway, 1994). This can be seen as an antidote to the unreactive and static nature of the printed book, as it offers the reader the possibilities of interactivity. This interactivity is manifested in the form of, for example, the ability to return to a difficult word, to see an explanation of an unfamiliar word, the capability to play inside a story, and the inclusion of games.

The additional elements offered by the electronic book may render it attractive to all young readers, but particularly to those for whom visual literacy is important. This possibility has resulted in the suggestion that electronic books have the power to bridge the gap between print and other media, consequently encouraging those children who are turning away from the print media (Meakin, 1997; Glasgow, 1997, 1996a, 1996b; Chu, 1994; Meyer, 1994; Jacobson, 1992; Meek, 1991; Balajthy, 1988; Adams, 1986).

However, a search through the literature finds a lack of evidence of the ability of electronic books to help either in the reading process, or in the teaching of reading. This lack of evidence relates to the two issues of whether reading electronic books leads children to read more in the form of other electronic texts, and of whether reading electronic books encourages children to read more printed books.
Chapter 2: Literature Review

Chapter 4 of the thesis discusses a particular genre of children's literature, and whether the electronic medium can and should encourage the reading of this type of book. Printed classics are believed by many in society to be the sort of literature that school age children should be reading, however, there is a general lack of interest in such literature at the present time. A discussion of the potential for and the use of classics in the electronic medium is included in the thesis. It comprises a detailed review of the literature appertaining to the nature of the classics and to the reasons which lead many in society to believe that children should be reading these texts. These issues will therefore not be discussed within the present Literature Review.

There are, of course, disadvantages related to electronic books for children, which will be largely the same as those already discussed in a general way in Section 2.3 (Table 2.2) of this Chapter. The most significant of these regarding children is probably the unequal access to the necessary technology in the home, at school and in public libraries. This will be discussed in greater detail in Chapter 8. With regard to the problems associated with reading from screens, however, it could be argued that the children of the present time are less likely to experience problems, since they are so accustomed to looking at screens of all shapes and sizes while interacting with new technology and new media. Indeed, the suggestion has been made that, for the child who has grown up with handheld computer games machines, using palmtop technology might appear to be more “natural and desirable than using the printed book.” (Gosling, 1998)

### 2.8.5 Children’s interaction with electronic books

A potential disadvantage has originated from the added attractions included in electronic books and concerns children’s comprehension of electronic books compared to their comprehension of printed ones. In her article discussing her first concentrated exposure to two particular children’s books on CD-ROM (Just Grandma and Me and Arthur’s Teacher Trouble, both published by Brøderbund), Graham (1994) expresses the view that children will be so interested in the added effects of the electronic book that their attention will be drawn away from the text. Graham suggests in particular that the animation and sound effects which occur during the reading process severely limit the chances that the “average child will glue her eyes to the print” (p 16). She further concludes that, since the “fun aspects” are linked
entirely to the illustrated text, this is where the child’s focus of attention is most likely to be, rather than on the printed text.

However, a study by Chu (1994) offers an alternative conclusion - that the special effects have an initial attraction which quite quickly wears off, leading on repeated readings to children ultimately treating computer books as printed books. Investigating the responses of three young readers (aged six years), the experiment involved participants reading five CD-ROM texts (all published by Discis Books), one each day for five days. It was noted that the children demonstrated great interest in reading the computer books throughout the study. However, one of the conclusions of the experiment was that all three participants

“... substantially reduced their hands-on interaction with the computer after the first few books. The unique features of interactive computer books such as visual imagery, color, and music were able to attract the subjects’ attention at first, but this novelty effect did not last throughout the study.” (p 361)

Chu’s study was limited in that three is too small a number of participants to be able to draw any major conclusions, although the author suggests that this small group allowed for in-depth observation.

A search through the relevant literature uncovers a general lack of understanding regarding children’s comprehension of electronic story books, which points to a gap in the research on this subject. A study by Greenlee-Moore and Smith (1996) did investigate children’s understanding of CD-ROM books, however, their intention was to compare comprehension with regard to narrative texts of differing length and complexity. Printed narratives were compared with the same narratives on interactive CD-ROM, and the main conclusion was that participants’ comprehension of longer and harder narratives was significantly better when reading from a CD-ROM version than when reading from a printed book edition. No difference was indicated by the results of the study when the participants were reading shorter and easier narratives. This study was designed to compare the understanding of different narrative text types, rather than comprehension in general, and it is limited in that it uses only children of above average ability. The authors
themselves admit a need for further research into the effects of interactive CD-ROM software when reading narrative texts.

As an indicator of the ability of electronic story books to have an effect on reading skills, Talley et al (1997) tested the effects of CD-ROM story book programs on preschool aged children's emergent literacy. Seventy three participants aged four years and from a Family Literacy Centre in America were given the chance to read CD-ROM story books during their "free-choice" time over a period of approximately eight weeks. They were split into three groups - the experimental group, the control group and the "well-read-to" control. The results indicated that CD-ROM story book programs may have a significant effect on the emergent reading skills of those children who are not particularly well-read-to prior to entering school. They are one way in which schools and other educational institutions can provide more exposure to books and print for those children who have not had such an opportunity at home.

Miller et al (1994) also investigated using electronic story books to teach reading. Four participants (all aged eight years) were involved in repeated readings (twice a week) of story books presented on CD-ROM and in print over a period of three weeks. The authors were primarily interested in the value in terms of reading of the facility within certain electronic books for looking up the meaning and pronunciation of unknown words. The conclusion was that this feature provides a "valuable instruction tool for teachers", with the caution that the study involved such a small number of subjects. It was also limited in that the printed and electronic books were not the same texts.

Perzylo and Oliver (1992) carried out an investigation of children's use of a CD-ROM product for information retrieval. The authors felt that the changes in the skills required for accessing and retrieving information caused by electronic sources could particularly affect children. They therefore attempted to investigate the possible outcomes from the use of a multimedia CD-ROM as a source of information for classroom research. A group of 32 pupils aged 12 years were given a CD-ROM encyclopaedia (Mammals: A Multimedia Encyclopaedia, National Geographic Society) to use as part of a library project over a four week period. Participants were placed in groups and given access to the computers on four separate occasions during the project. A notable conclusion which was drawn from the study is that the visual and auditory
forms of information proved to be quite a distraction for the participants, and seemed to prevent them from reading the textual information presented on the screen. This seems to concur with Graham's proposition that the added effects of electronic books can be a source of distraction to readers. Furthermore, some of the participants found certain information contained in the photographs and video clips very useful, and even though they did not write such information down at the time of viewing it, they remembered it and made use of it in the summary paper of the library project.

The only study which has investigated what young people think of electronic books is the survey of Young People's Reading at the End of the Century (Children's Literature Research Centre, 1996), discussed above and at various points throughout the thesis. The relevant findings of the survey are that electronic books are unlikely to replace printed books; boys show a stronger tendency to use electronic texts than girls; electronic fiction is currently read more by younger children than by adolescents; and electronic fiction fails to meet adolescent requirements. The pertinent results of the study are discussed in greater detail in Chapter 3, and will not be pre-empted here.

The ideas and reasoning surrounding the study of author popularity for children which is part of the current thesis have already been discussed in the Introduction to the Thesis. A detailed review of the literature relating to this subject has been included at the beginning of Chapter 5, and so will not be considered here.

### 2.9 Electronic Book Suppliers

#### 2.9.1 Libraries

There can be little doubt of the important role played by the library in a consideration of books of any kind. Although their major function of providing books and reference material has endured in virtually the same manner since the initial establishment of public libraries, it is clear that libraries in general have always been, and continue to be, ready and able to change in order to accommodate new technology (Culture, Media and Sport Committee, 2000; Goodman, 1993, Hoffert, 1992; Hatvany and Lukey, 1990). It should be noted that these technological shifts are likely to affect academic
and public libraries in different ways. Due to its concentration on children, this thesis will concentrate on public rather than academic libraries, since young readers have very good access to the former, but limited opportunities with regard to the latter.

The new technology being integrated into public libraries includes sound and video recordings for loan, and more recently, electronic books, particularly electronic information sources. Furthermore, there are indications that public library audio visual issues, which include CD-ROM, are on the increase (Creaser, 1999). These new elements within the library mean that it is become increasingly necessary for libraries to provide mechanisms by which users are able to use and interact with both paper-based and electronic publications (Barker, 1992). This leads to an entity which has been called the “polymedia library” by Barker (1997) and the “hybrid library” within the higher education Electronic Libraries Programme (eLib), a concept which is explored in greater detail in Rusbridge (1998). Taking the idea of electronic publication to its extreme ultimately results in the concept of the fully electronic library, also known as the virtual or digital library. These terms refer to a library in which the full text of documents is available online, links between documents are possible, and users can access the library remotely from any location through a network (Catenazzi et al, 1993). Universal accessibility is stressed, which means that books can be replicated as often as necessary, the library has no limit as to its number of books, and individual libraries may be interconnected (Catenazzi and Sommaruga, 1995; Landoni et al, 1993).

Therefore, if the prophesied demise of the printed book does occur, libraries will necessarily become very different places. In the same way as the printed book has been at the centre of “conventional, ‘paper-based’ libraries” (Barker, 1996), it can be argued that the electronic book will be at the heart of the digital (or electronic) library (Barker, 1997; Landoni et al, 1993; Yankelovich, 1991). Indeed, it has been suggested that the main obstacle to the idea of fully digital libraries becoming reality is not technological, but concerns the need to modify traditional environments. That is, there are legal, political, social and psychological problems associated with changing the nature of the library (Landoni et al, 1993). Electronic libraries are an important aspect in a consideration of electronic books, however, the scope of this thesis does not allow for a full consideration of the issues and literature pertaining to this subject, which is well documented elsewhere (e.g. Rusbridge, 1998).
Chapter 2: Literature Review

The potential impact presented by the introduction of electronic books into libraries implies that a study of the relationship between the two would be of significance. The literature review found that it was fairly widely accepted that electronic books will have a significant effect on the traditional library, and will play a very important role in digital libraries (Catenazzi and Sommaruga, 1995; Landoni et al., 1993). The literature which was found mainly concerned speculation on possible roles for libraries and librarians as electronic books enter the library alongside traditional printed books (e.g. Woodward, 1995; Goodman, 1993). Furthermore, it seemed that a greater number of Americans writers were concerning themselves with this subject than were the British (e.g. Zipkowitz, 1995; Robinson, 1992). Many writers believe that the existence of libraries could be threatened by new technology (Zipkowitz, 1995; Seiler, 1992; Robinson, 1992; Kurzweil, 1992b). However, most also believe that advantages are to be gained from new technology if librarians ensure that they are in the vanguard of those who embrace the changes (Stern and Connaway, 1999; Robinson, 1992; Kurzweil, 1992b, Hoffert, 1992; Hatvany and Lukey, 1990), developing both their own role and that of the library accordingly. It is therefore hoped that print media and traditional library services will exist alongside new technology (Woodward, 1995; Zipkowitz, 1992), although Kurzweil (1992b) is of the opinion that libraries will emphasise electronic books over printed ones as the former become more dominant. An insightful fantasy describing the children’s electronic library of the future is presented by Sandlian (1997), comprising hundreds of networked computers which offer many varied features including electronic texts.

There also exists a survey which aimed to examine the scale and impact of open access CD-ROMs in public libraries (Batterbee and Nicholas, 1995). The study was confined to the use of commercial CD-ROMs in public libraries, and concentrated on those CD-ROMs which provide information. The authors had noticed a lack of literature on the subject of CD-ROMs in public libraries, with most studies focusing on academic and special libraries. The study was concerned with library users rather than library staff. At the time of the survey, the authors discovered that very few Public Library Authorities (PLAs) had a policy of open access, and were able to identify only 17 PLAs which were eligible to participate. Of these, three were chosen as being suitable for a user survey, and as a result, 87 questionnaires were completed and analysed in early 1994. Among other results, the survey found that nearly two thirds of the 17 PLAs which took part in the study had experienced
problems with open access to CD-ROMs. With regard to the impact on the library staff, it was found that offering open access to CD-ROMs was having a major effect. That is, work patterns were affected, new skills were having to be learnt, and staff were being required to place greater emphasis on user education and systems management than they had previously.

Some figures on CD-ROM in public libraries are provided by CIPFA (1999). These figures cover the United Kingdom in the financial year 1998-99, and are shown in Table 2.3 below.

<table>
<thead>
<tr>
<th>CD-ROMs and software lent</th>
<th>19,476</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of computer terminals with CD-ROM facility available for use by the public</td>
<td>4,841</td>
</tr>
<tr>
<td>No. of service points with terminals with CD-ROM facility for use by the public</td>
<td>1,911</td>
</tr>
<tr>
<td>Annual issues of CD-ROMs, software, etc.</td>
<td>744,000</td>
</tr>
<tr>
<td>CD-ROMs, software, etc. stock in reserve and on loan as at 31st March 1999</td>
<td>67,000</td>
</tr>
</tbody>
</table>

Table 2.3: CIPFA figures on CD-ROM in public libraries

With particular reference to CD-ROMs available in children’s libraries, Creaser’s *Survey of library services to schools and children in the UK 1998-99* (1999) found that 73% of UK local authorities offered CD-ROMs, which were usually for reference use only. It is difficult to be sure which authorities offer CD-ROMs in the children’s library, and which offer them in the library as a whole, but not specifically in the children’s section.

It can therefore been seen that there is very little literature on the subject of how traditional libraries in the UK and the librarians working in them are dealing with electronic books at the present time. This uncovered a gap in the literature with regard to the current position of electronic books within libraries.

### 2.9.2 Booksellers

In addition to the users of electronic books, there are other agencies which are likely to have an interest in electronic books. A prime example of such agencies can be found in book shops, whose business is likely to be affected by the fear that electronic books might supersede printed books (Langstaff, 1993; Lambie, 1994). In addition, as information in general becomes more and more easily available online, the Internet could represent a threat to the need
Chapter 2: Literature Review

for book shops (Borrell, 1992). The text of many non-copyright books is currently available directly via the Internet, and there have been forecasts that all books might one day be accessible in this way (Church, 1995). In fact, a publisher which recently placed 1,700 of its current titles on the Internet increased its sales for the following year by 17 per cent (Berselli, 1997). McGuire (1997) sees writers being able to publish directly on to the Internet, thereby having no need to persuade booksellers to offer their titles. The Internet also presently offers opportunities for publishers to market and sell directly to the customer, thereby cutting out the retailer completely (Farrington, 1994). However, there are possible advantages in the Internet for niche book shops being able to reach a huge audience and a correspondingly large potential market for their products (Farrington, 1994). The larger book chains have, however, discovered a potential answer to this problem by introducing their own "Internet bookstores", with recent launches in Britain by Dillons and Waterstone's (Glaister, 1997). Such electronic shops mean buyers can order and pay for books, but also offer marketing opportunities through the inclusion of publishers' details, short extracts and examples of covers. These facilities are, however, unlikely to be easily available to, or relevant to, the needs of the majority of smaller book shops. The larger booksellers do not see these electronic shops as a threat to traditional retailing, but insist that the two can co-exist, pointing out that many customers are likely to prefer the immediacy of browsing and buying in person (Glaister, 1997). The importance of the physical act of browsing and the delight of handling printed books are, in fact, widely cited as significant benefits of book shops (Church, 1995; Langstaff, 1993; Borrell, 1992).

As electronic books become increasingly more of a presence in book shops (Lambie, 1994), some of the difficulties which might be encountered through selling electronic books have been highlighted. For example, the provision of equipment for demonstrating the products, the need to supply technical support, and the wider range of competitors (Lambie, 1994); finding space for display within the shop (Langstaff, 1993), and the requirement for greater security. The above are the issues relating to electronic books and book shops which were encountered in the literature. There was, however, a lack of material concentrating on the role and opinions of book shop owners and staff on the subject of electronic books.
2.10 Conclusions

It can be concluded from the review that there are a large number of advantages and limitations of electronic books noted within the literature. However, since the relative importance of these is not addressed in any great detail, it is difficult to be sure whether the advantages will outweigh the limitations or vice versa. In addition, the majority of the advantages and limitations are considered from the end users’ perspective, and it can be argued that other stakeholders, for example, librarians and book shop owners and managers, have important views on this issue.

The literature review showed that the use of the book metaphor is a significant concept in the design of electronic books. Indeed, it has been rated by the greater number of authors as being critical for their ultimate success.

Opinions on the likelihood of the printed book being superseded by its electronic counterpart have not changed appreciably over time, and the prevailing view throughout the 1990s has been that the two are likely to exist alongside one another (see, for example, Cawkell, 1999; Eco, 1995; Goodman, 1993; Jackson, 1992).

The literature review showed that the electronic book as presented on CD-ROM has recently been the dominant example of the electronic book. However, the rising significance of the Internet and, once again, the emergence of e-books, is now already taking over from CD-ROM.

The indications are that there has been no great decline in the reading of fiction amongst children. Furthermore, there is no evidence to suggest that novel technologies and media are preventing children from reading, although evidence was found suggesting that there is an inverse relationship between the amount of time spent reading and the amount of time spent watching television. The literature review raised the suggestion that, although reading may not be in decline, the type of reading which is occurring is changing. It was noted that a wide range of media is available to the children of the present time, and that they are successfully integrating the extensive use of these into their lives.
Chapter 2: Literature Review

The literature review uncovered a lack of evidence relating to the twin issues of whether reading electronic books leads children to read more in the form of other electronic texts, and of whether reading electronic books encourages children to read more printed books. In order to try to fill this gap in the research, a discussion of this issue is being included in Chapter 3.

It was felt that comprehension of an electronic book might be compromised by its inclusion of potentially distracting special effects. A general deficiency in the knowledge on the subject of children’s comprehension of electronic story books was discovered, and this pointed to a need for research into the issue. A study whose main aim was to discover the extent to which children’s comprehension of an electronic text compares with their comprehension of the printed medium was therefore designed.

If children are to be able to read books of any kind, they must obtain them from somewhere. Presently books are either borrowed from libraries (particularly public libraries) or bought from book shops. It was found that there was a lack of material concentrating on the role and opinions of book shop owners and staff on the subject of electronic books. A similar gap in the literature was evident on the subject of how traditional libraries in the UK and the librarians working in them are dealing with electronic books at the present time. It was therefore decided to discover, via questionnaire surveys, what are the role and opinions of booksellers and library staff on the subject of electronic books. The surveys also aimed to discover the extent of electronic books already in book shops and libraries, and the effects which these are having on the institutions which do accommodate them.

This has been a thorough review of the literature dealing with the various issues surrounding the subject of electronic books. The thesis continues with a discussion of whether electronic books have the power to bridge the gap between print and other media, and thereby encourage children to read, particularly those who are “reluctant” readers.
Chapter 3: Can Electronic Books Encourage Children to Read More?

3.1 Introduction

As noted previously in the Introduction to the thesis, the electronic book represents the combination of some of the advantages (and disadvantages) of the printed book with the capabilities of the computer, rendering it attractive to children, particularly those for whom visual and computer literacy have become very significant. This has led to the suggestion that electronic books might have the power to bridge the gap between print and other media, and thereby encourage those children who are turning away from the print media (Adams, 1986; Balajthy, 1988; Jacobson, 1992; Meyer, 1994; Chu, 1994; Glasgow, 1996a, 1996b, 1997; Meakin, 1997). It has also been argued that “new methods of producing book texts, especially those with illustrations, encourage both reading and readership” (Meek, 1991 pp37-38). Claims have been made that electronic books can encourage and help both in the reading process, and in the teaching of reading, however, a search through the relevant literature finds that there is little or no evidence of their ability to do so. This apparent lack of understanding points to a gap in the research on this subject, and it was therefore decided that a further discussion of this issue should be included in the thesis.

There is much material on the subject of the attractions offered by electronic books to young readers (Graham, 1994; Kafai and Soloway, 1994; Sefton-Green, 1994, Bennett, 1994; Jacobson, 1992). These attractions include animated pictures, sounds, a narrator, text which is highlighted as it is read, and interactivity, all of which make the process of reading more like playing a game. However, some doubts have been expressed that the makers of electronic books have not yet fully exploited the computer medium (Kafai and Soloway, 1994; Shade, 1994). It seems that the attractions of the electronic book do delight children (Talley et al., 1997; Chu, 1995), however in many cases this may be on a first encounter when the concept is new, so that the initial fascination with the special effects inevitably wears off (Chu, 1995). Some work has also considered whether electronic books could help children to learn to read (Talley et al., 1997; Medwell, 1996; Meyer, 1994), while Miller et al (1994) noted some improvements in children’s reading through the use
of storybooks presented on CD-ROM. However, there have been some doubts about the impact of the visual media in schooling (Sefton-Green, 1994, Shade, 1994; Kafai and Soloway, 1994) Moreover, even if electronic books do help in the teaching and learning of reading, it may not necessarily mean that children will find them an encouragement to read more.

There are two issues within the question of whether electronic books can encourage children to read. These are as follows:

- can electronic books encourage children to read more in the form of other electronic texts?
- can electronic books encourage children to read more printed books?

3.2 Can Electronic Books Encourage Children to Read Other Electronic Texts?

With regard to whether children like reading electronic books, the Children’s Literature Research Centre (1996) received replies from approximately 8,800 children aged between 4 and 16 to the question, “Do you prefer to read: electronic books on a computer, ‘traditional’ books on paper, (or do you) like both equally?” The study found that 31% of the boys preferred to read electronic books (with 31% preferring printed books and 38% showing no preference). Of the girls, 7% preferred to read electronic books and 62% preferred printed books, while 31% showed no preference for either format. It was therefore concluded that "Boys exhibit a stronger tendency than girls to use electronic texts" (p230). This may be explained, at least in part, by the fact that boys traditionally prefer to read non-fiction, while girls traditionally prefer to read fiction, and the choice and quality of electronic reference books were thought by the authors of the report to be superior to those of electronic story books at that time. The survey also found that the younger children were reading more electronic fiction than the adolescents. This can be explained by the fact that there was more choice for younger readers than for older readers with regard to story books in the electronic medium.

With regard to the subsequent question asking for reasons for preferring one or other medium, more children (31%) rationalised their preference for printed books in anti-computer terms than did children who explained their
preference for electronic books as a dislike of printed books (0.78%). This suggests that the children who preferred reading electronic books had no resistance to printed books, but they did have a preference for computers. Conversely, those who preferred to read printed books did exhibit a certain level of resistance to computers. It was also found that the children were actively positive about the portability and privacy of the printed book. These results could mean that those children who preferred reading printed books because of their resistance to computers would be unlikely to wish to read other electronic texts. However, having experienced a text they like in the electronic format, they might be encouraged to read the same or similar texts in printed format.

With regard to resistance to computers, evidence suggests a general feeling in favour of computers among young people. As discussed in the 1997 survey by Livingstone and Bovill (1999), computer-based media have gained a significant place in the lives of young people. The primary association with computers for the children was found to be with games, and the study found that IT has a very positive image among young people. 92% of participants (N = 1300, aged 6-17 years) said they were comfortable with computers, and 81% thought they were exciting. When asked which media they would most like for their next birthday, 35% wanted a PC, and this was the top answer. The study also found that 63% of participants thought it was more important that they are computer literate than that their parents are. It is, in fact, often observed that many children are more conversant with computers than are their parents (Bromley, 1996).

Kafai and Soloway (1994) give an example of a child who reads her printed books over and over again, but reads each of her electronic books only once. Indeed, Graham (1994) feels it unlikely that, as an adult, she would revisit electronic texts, because all the illustrations in the book which she viewed had been enhanced with effects, leading to a lack of the need for creativity on the part of the reader. She suggests there is evidence that children feel the same way, that is, "... the work the reader has to do has all been done for them." (p 16). Graham notes that the re-reading of texts is important as a way of helping children to become readers, and does allow that children might want to revisit an electronic text in order either to share the added effects with others, or to experience the effects again themselves. However, being so interested in the pictures, animation and computer effects may mean that the text itself will be largely ignored, so that the book is not really being read.
3.3 Can Electronic Books Encourage Children to Read More Printed Texts?

With regard to the second issue of whether electronic books can encourage children to read more printed texts, it is interesting to note that the subjects taking part in an unpublished MSc project by Keady (1995) claimed that they thought they would be encouraged to read the classics more often through exposure to electronic books on CD-ROM. The electronic environment is being used as a means of encouraging children to read more and to share their views on the books they read in the Stories from the Web project (1999). There is no other evidence that reading electronic books can encourage the reading of printed texts, so in order to consider this issue further, a comparison will be made here with the effects of children's exposure to other non-print versions of literary texts. It is widely accepted that television and film versions of books encourage the reading (or re-reading) of the original text, in the case of both adults and children. For example, the survey by the Children's Literature Research Centre (1996) argues that,

"... since the early days of radio and television it has clearly been established that ... hearing/viewing a version of a book stimulates young people to read it for themselves." (p 95)

The Children's Literature Research Centre report points out that reading a book after or at the same time as listening to or viewing another version of it can make young readers more sure about enjoying and more able to deal with the language, period, and narrative experimentation involved. Indeed, the survey found that having seen a film version of a book encouraged children to choose it to read. Another survey of children's reading choices (Hall and Coles, 1999) found that "the visual media have a strong influence" (p133) on those choices. The survey, carried out in 1994/95, discovered that of the list of books that children had read in the four weeks previous to the survey date, approximately one in seven books had some sort of media tie-in. Watkins and Sutherland (1995) point out how television has been able to encourage reading, and to revitalize such "classics" as *Thomas the Tank Engine*, *The Borrowers* and the Narnia series by C.S. Lewis. They also highlight the fact that television characters have featured in tied-in books, for example, Postman Pat. Indeed, there are many instances of the placing of television and film characters in books, for example, *Teletubbies* (BBC Children's Books, 1997),
Chapter 3: Can Electronic Books Encourage Children to Read More?

_Tweenies_ (BBC, 1999), _Toy Story 2_ (Disney, 2000) and _A Bug's Life_ (Disney, 1999). Although this may be seen as a marketing ploy to ensure that the most is made of temporarily popular products, these do have the power to encourage children to read books. In addition, Bradman (1995) discusses current reissues of children's classics, and finds countless versions of _Little Women_, which have been "very likely influenced by the recent film" (Dir. Armstrong, 1995). Furthermore, it is quite plausible that the link between the visual media of television and film and the printed medium might apply the other way round, that is, reading a book might encourage a reader to view a film or television version of the text (Waterland, 1989).

With regard to another non-print medium, audio books, the Children's Literature Research Centre (1996) survey found that children who described themselves as "'reluctant'" readers were more likely to say they liked listening to tapes as much as or more than reading to themselves than those children who described themselves as "'enthusiastic'" readers. Perhaps more importantly, the Children's Literature Research Centre (1996) survey found that:

"... at all Key Stages significant numbers of respondents said they were stimulated (by listening to a book) not only to read the same book but also to read other books by the same author and other books which they think will be similar." (p 95)

Hoffman (1995) is very enthusiastic about books on cassette, and believes that the "phenomenal growth of audio books" can help to forecast the future of the electronic book. Indeed, Hoffman defines the audio book as an electronic book, because it requires electronic equipment to listen to, and because computers are often used in the creation of audio works. Perhaps most importantly, Hoffman points out that "... some audio book producers use digital equipment to record voices and create digital sound effects and music." He finds it conceivable that listeners might "... become interested enough in the author or subject to seek out print resources." (p 47). It therefore seems that audio books have as much power to encourage children to read printed texts as do television and film.
3.4 Conclusions

There is no doubt of the appeal of television and film/video to children (see *Introduction to the thesis*). There are also indications that electronic books have many attractions for children, however, these may be temporary in nature. Although claims have been made for the ability of electronic books to utilise these attractions to encourage reluctant readers and to encourage children to read more generally, there is no evidence of their having such an ability. If electronic books are sufficiently similar to these media by being equally entertaining and attractive, children should enjoy them as much and, having experienced one electronic book, be encouraged to read more. There are currently less computers in homes than there are televisions, but this does not necessarily mean they are less desired. More time is spent by children watching television than using computers (Livingstone and Bovill, 1999), however, this is very likely to be as a result of access problems, since there are less computers in homes than there are televisions. It could be a result of the lower price of televisions, and the fact that they have been around longer than computers, and have therefore had more time to achieve greater market penetration.

The above discussion demonstrates that television, film and audio (including radio) versions of texts do encourage the reading of printed editions (and vice versa). It therefore seems acceptable to argue that electronic books may have the potential to exhibit the same effect. This is likely to be dependent on how similar electronic books are to television, film and audio. In the case of audio books, according to Hoffman (1995) and Nielsen (1998), they are one and the same, and if they are, then these types of electronic books at least do encourage children to read printed books. Electronic books share sounds with radio, and have both animated pictures and sounds in common with film and television. They may even offer more in the shape of interactivity. However, it is difficult to be sure how similar electronic books actually are to television and film, therefore research into this subject is needed.

This Chapter has discussed electronic books in general as an encouragement to read. A good example of books which children are not reading, but which many in society believe they should be reading is found in the classics. There currently exists a large number of electronic versions of classics, and these
Chapter 3: Can Electronic Books Encourage Children to Read More?

will be investigated in the following Chapter as a particular type of electronic book which might play a part in encouraging children to read.
Chapter 4: The Role of Children’s Classics in the Electronic Medium

"Within a week, Matilda had finished *Great Expectations* which in that edition contained four hundred and eleven pages."
Dahl (1988 p 14)

4.1 Introduction

The significance of literacy has already been discussed within the present thesis, as has the existence of a general belief that the emergence of the modern technologies such as television, film and computers is affecting our children’s desire to read. One particular genre of literature that many in society believe that children should be reading is found in the classics (Hobson et al, 1992; Winfield, 1986; National Curriculum, 1995). However, there is evidence that the classics do not have a general appeal to modern children (Waterland, 1989; SCAA, 1995; Keaney, 1993). Nevertheless, electronic versions of classic texts are one of the more readily available types of electronic book at the present time (Meakin, 1997; Bennett, 1994). In common with electronic books in general, electronic versions of the classics may have the ability to encourage children to read and enjoy the classics, both in electronic and printed form.

The following discussion is therefore concerned with the potential for and the use of the classics in the electronic medium. It includes a detailed consideration of the nature of classic texts, and a discussion of the reasons which lead many in society to believe that children should be reading these texts. The contrasting lack of appeal to the majority of young readers of the classics is also examined, and possible reasons for this situation are discussed. Particular emphasis is placed on the issue of whether the electronic medium ought to help to encourage children to read more classic stories, and indeed if it has the ability to do so.
4.2 What is a Classic?

The term "classic" is often used loosely and is a term which can be applied equally to children's and adult's literature. Some "classics" are also written for adults, but become generally accepted as stories for children, widely recognized examples being Gulliver's Travels (1726) and Robinson Crusoe (1719) (Darton, 1982; Thwaite, 1972; Kinnell, 1995). However, the present thesis will concentrate on the classics of literature which were intended by their authors to be read specifically by children.

It is also difficult to define exactly what is meant by children, since the concept of childhood has varied from period to period, and is extremely complex. This obviously causes difficulties when discussing children's literature, and might go some way towards explaining why some texts written for adults become accepted for children. For the present purposes, children will be considered to be aged from birth to the age of 16, the latter age being the one at which children may legally leave school in the UK.

Definitions of a classic text are offered by Winfield (1986):

"... literary work that has ... endured over time, has universal meaning and explores the human condition.... A classic may be part of a reader's cultural heritage. Over the years, readers have determined what are the classics" (p 26),

and by Keaney (1993):

"... a book that has stood the test of time. This means that more than one age has read it and decided that it has something really important to say. " (p 16)

Not untypically, both of these authors' definitions involve the notion of enduring over time. This idea introduces an issue which lies at the heart of children's literature, and which concerns the intervention of adult readers. It is adults, particularly parents, who often select and buy books for children (Children's Literature Research Centre, 1994), therefore they have a certain influence over what children are reading. This is true for all children's
literature. However, in the case of classics which are assumed to endure over time, it is necessary for them to be read and enjoyed by a generation of children, who then become adults, and select and buy them for the following generation of children. That is, children are the primary readers, but their parents or other adults are the former readers who come to represent the buying power. As suggested by Winfield (1986) in the above quotation and quoted above, readers determine what are the classics.

In order to endure over time, texts must have meaning for more than one generation. This means that, although much emphasis is often put on the importance of enduring over time, books are not classics purely because they are old. A text which attains the status of a classic must naturally be of sufficient quality to command instant success in the first place, in order to be enjoyed by its immediate readers, and then to continue to be enjoyed, therefore standing the test of time. The features which might help to ensure this continuation of interest are the subject of literary theory and criticism, and include such elements as effective characterization and narrative, illustration and, as suggested by both Winfield and Keaney above, an enduring and universal message or moral. It is, however, difficult to define the qualities which immediately interest readers, since reading tastes are so individual.

Furthermore, texts which do offer the appropriate qualities, and which enjoy immediate success may quickly be recognized as classics. This can be seen in the case of Hunt (1991) claiming Janet and Allan Ahlberg’s 1986 text, The Jolly Postman, or Other People’s Letters to be a “new ‘classic.’” Such texts are usually referred to as “modern classics,” and other authors whose work might be considered in this category include Roald Dahl, C. S. Lewis, Mary Norton and Arthur Ransome (Penguin Stocklist, 1999).

Perhaps another reason why classics survive, once they have attained the first success, is because of the importance placed on them by society. This is manifested in the views of many interested parties, the main ones being teachers, critics, educationists, and librarians. In this regard, Hobson et al. (1992) see the classics as an important part of the heritage passed down to children, something which should be preserved, and James (1993) stresses her belief in the significance of the classics in the teaching of English. Winfield (1986) sums up the view that the classics are valuable when he suggests that
"good literature stimulates thinking, evokes ideas, creates mental images and engages the emotions. Good books also encourage children to read more deeply and often. The classics provide this for readers of all ages." (p 26)

The feeling in favour of classic texts within the British Department of Education is represented by their inclusion in the National Curriculum (1995), which attempts to list authors and texts which it sees as required reading. However, as commented by the Children’s Literature Research Centre (1994), the first of these lists sparked much controversy which affected the education system in 1992/3. The list, intended for testing seven-year-olds:

“contained 51 approved books, many of which had been out of print for some time, and was instrumental in provoking debates about the choice of reading matter in school.... These debates ranged from concern over the use of extracts and the use of canonical literature (dominated by dead, white, European (sic) males)....” (p 2)

Parents and other relatives have a different influence on children, through buying the books, although they are likely to be affected by the opinions of teachers, librarians, critics and educationists. Book publishers are also likely to have an influence, through deciding which books to publish, and attempting to answer the demand which they perceive to exist in the market. It can therefore be seen that importance is placed on the concept of classics within the social system. It should also be remembered that classics play a different role in different cultures, and the changing demography of children is making us realize that “our multicultural society must find itself reflected in books for children” (Meek, 1991). Such a reflection would be difficult to detect in texts written by “dead, white, European males” but might be present in “modern classics” (both discussed above).

These issues all demonstrate a lack of agreement over the nature of a classic, and this naturally leads to disagreement over exactly which texts can be labelled as such. There are certain works which are considered classic by some writers, but not regarded as such by other writers. As a result, it is not possible to offer a definitive list of children’s works which are widely accepted as being classics. However, it does seem that there is a “canon” of children’s literature, including the work of such writers as Lewis Carroll,
Kenneth Grahame, E. Nesbit, and A. A. Milne (Hunt, 1991), which is generally regarded as having attained classic status.

Table 4.1 represents an attempt to illustrate both the agreement and the disagreement in the debate. The table includes titles suggested as examples by the British National Curriculum for Key Stage 2 (age 7-11) as "Long-established fiction" (Hymas, 1993). It also includes titles suggested for Key Stages 3 and 4 (age 11 to 16), examples taken from Hymas. In addition, the table gives those titles suggested as being classic texts by Winfield (1986) in his article considering why children should read the classics. The table also gives details of the titles discussed by Carpenter (1985) as "classics of a particular kind" which appeared in England between around 1860 and 1930.

None of the three sources makes the claim that the titles they suggest as being classic constitute a definitive list. Indeed, Carpenter states that he has made some omissions in his book, for example, R. L. Stevenson, Rudyard Kipling and Mark Twain, suggesting that he considers that some or all of the works of these writers may be considered classics. Indeed, it is recognized that, partly as a result of this admission by Carpenter, his is perhaps not the best of references to include. The controversy surrounding the National Curriculum lists is also noted. However, it has been difficult to find authors willing to list any titles as being classics, thus proving the lack of precise agreement which exists on this issue.

Lastly, Table 4.1 gives details of those books cited by the first three sources which are listed in the Penguin Stocklist of October 1999 as being published as Puffin Classics. It is recognized that publishers may have their own reasons for describing a text as classic, for example, emphasizing texts which are out of copyright and therefore cheaper to produce, or attempting to appeal to a particular market. However, it was thought useful to give this information as a supplement.

As might be expected, the lists do not correspond exactly. For example, Adventures of Huckleberry Finn (1884) is included by two of the sources, while the three texts by George MacDonald are cited only by Carpenter. However, agreement is shown among these sources in the examples of Alice's Adventures in Wonderland (1865), Little Women (1868) and The Wind in the Willows (1908), which are included by all three sources, and as Puffin Classics.
Chapter 4: The Role of Children's Classics in the Electronic Medium

<table>
<thead>
<tr>
<th>Author</th>
<th>Title (first publication date)</th>
<th>Cited by:</th>
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<tr>
<td>Alcott, L. M.</td>
<td>Little Women (1868)</td>
<td>C, NC(3), W, P</td>
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<td>Austen, Jane</td>
<td>Pride and Prejudice (1813)</td>
<td>NC(4), P</td>
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<td>Peter Pan (1902)</td>
<td>C, NC(2), P</td>
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<td>Jane Eyre (1847)</td>
<td>NC(3), P</td>
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<td>Wuthering Heights (1847)</td>
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<td>Alice's Adventures in Wonderland (1865)</td>
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<td>Through the Looking Glass (1871)</td>
<td>C, W, P</td>
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<td>The Moonstone (1868)</td>
<td>NC(4)</td>
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<td>What Katy Did (1872)</td>
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<td>The Red Badge of Courage (1895)</td>
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<td>A Christmas Carol (1843)</td>
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<td>Great Expectations (1861)</td>
<td>W, P</td>
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<td>A Tale of Two Cities (1859)</td>
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<td>Wessex Tales (1888)</td>
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<td>The Mayor of Casterbridge (1886)</td>
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</tr>
<tr>
<td>Lewis, C. S.</td>
<td>The Lion, the Witch and the Wardrobe (1950)</td>
<td>NC(2)</td>
</tr>
<tr>
<td>MacDonald, George</td>
<td>At the Back of the North Wind (1871)</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>The Princess and Curdie (1882)</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>The Princess and the Goblin (1872)</td>
<td>C, P</td>
</tr>
<tr>
<td>Melville, Herman</td>
<td>Moby Dick (1851)</td>
<td>W</td>
</tr>
<tr>
<td>Milne, A. A.</td>
<td>Winnie-the-Pooh (1926)</td>
<td>C, NC(2)</td>
</tr>
<tr>
<td>Nesbit, E.</td>
<td>The Railway Children (1906)</td>
<td>C, NC(2), P</td>
</tr>
<tr>
<td>Norton, Mary</td>
<td>The Borrowers (1952)</td>
<td>NC(2), W</td>
</tr>
<tr>
<td>Potter, Beatrix</td>
<td>The Tale of Peter Rabbit (1901)</td>
<td>C, W</td>
</tr>
<tr>
<td></td>
<td>(and all other stories)</td>
<td>C</td>
</tr>
<tr>
<td>Ransome, Arthur</td>
<td>Swallows and Amazons (1932)</td>
<td>NC(2)</td>
</tr>
<tr>
<td>Stevenson, R. L.</td>
<td>Treasure Island (1882)</td>
<td>NC(3), P</td>
</tr>
<tr>
<td>Stowe, Harriet Beecher</td>
<td>Uncle Tom's Cabin (1852)</td>
<td>W</td>
</tr>
<tr>
<td>Swift, Jonathan</td>
<td>Gulliver's Travels (1726)</td>
<td>NC(4), W, P</td>
</tr>
<tr>
<td>Twain, Mark</td>
<td>Adventures of Huckleberry Finn (1884)</td>
<td>NC(3), W, P</td>
</tr>
<tr>
<td>Wilder, Laura Ingalls</td>
<td>The Little House on the Prairie (1935)</td>
<td>NC(2)</td>
</tr>
</tbody>
</table>

Table 4.1: Suggested classic texts

NC(n) = National Curriculum (n = Key Stage number)  
C = Carpenter (1985)  
W = Winfield (1986)  
P = published in Puffin Classics series

Table 4.1 certainly appears to endorse the ideas about classics discussed above. That is, some of the titles listed were written for adults, but have become generally accepted as also suitable for children, for example, Jane Eyre.
(1847). Some of the works have proved their ability to endure over long periods of time, for example, *Robinson Crusoe* (1719), and some have been comparatively quickly established as classics, for example, *The Borrowers* (1952).

### 4.3 The relevance of classics to children

Even if we accept the view that the classics have some importance in terms of literary value, or some significance within the social system, this does not necessarily mean that children themselves will automatically find them interesting. Waterland (1989) discusses the school of thought which states that books such as A. A. Milne's *Winnie-the-Pooh* (1926) (regarded as a classic — see Table 4.1 above) have no relevance to young readers of today, being "middle class and twee", and including difficult language and inappropriate morality (p 188). Her role as a teacher in a modern British school also leads her to comment that: "In many ... schools the gap between child and 'classic' author seems insurmountable." (p 188) Waterland acknowledges a widespread lack of knowledge among the children she has encountered about the classics of children's literature, and implies that parents are not generally introducing the texts to their children: "Most of our children come into school with limited ideas of the place of books in their lives and with only the ... unliterary language of their homes to support their reading experiences." (p 188)

This view is shared by James (1993), who observes a lack of knowledge of the literary heritage of Britain. Further support is offered by a report produced by the School Curriculum and Assessment Authority (SCAA) (1995) which describes the study of the teaching in particular schools in the UK during one week in March 1995, and which found that children currently read few classics. Furthermore, a study of children's reading choices carried out on 7976 participants during 1994 (Hall and Coles, 1999) found that one in six (16.7%) of the titles included in the most popular 200 titles might be considered "children's classics".

This lack of knowledge of the classics might be caused by the traditional image of such works, that is, that they are rather long and difficult to read, causing children to be discouraged from reading them. This could lead
children to subscribe to the view that reading classics is more of a duty than a pleasure. This is illustrated by Keaney (1993) quoting Mark Twain claiming a classic to be ""a book which people praise and don't read,"" and noting that "The classics are often talked about as if they were something you should take for the sake of your health ... parents think they are essential ..." (p 16). The image of classics as being long and complex is not likely to appeal to children who are accustomed to media other than print, such as television, cinema, video and computer games, as everyday tools.

The classics are declining in popularity, and one reason might be because teachers do not themselves find much interest in the classics, either finding it hard to instill interest in their pupils, or avoiding teaching classic texts. This latter suggestion was implied within the SCAA report which found that, although teachers insist that they teach the classics, during the one week in March under study, just seven per cent of 13-year-olds and four per cent of 16-year-olds read "Older fiction" while at school.

It does appear, therefore, that children lack knowledge of the classics and perceive them to be irrelevant to our modern multicultural society, despite the importance placed on them by literary critics and the social system. It therefore seems significant to raise the question of whether it is actually important to conserve the classics and teach them more pointedly. The case for the classics has been implied in the discussion so far, but will be argued more explicitly here. Those texts which are generally accepted as being classic, whatever the date of publication, will necessarily have been an instant success, implying that they have some appealing characteristics. There are suggestions that children of today still find these qualities appealing when read aloud, and that they still enjoy reading the stories (Waterland, 1989). Classics are usually considered to be "good literature" which stimulates the ideas and emotions of its reader (Winfield, 1986), and according to Chu (1995), there is currently a major trend towards using "quality literature" in reading/literacy instruction. Indeed, the classics are almost invariably stories, which are an integral part of the reading process. It could be argued that the qualities offered by the classics which have appealed to past generations might not seem so widely attractive now because of the changing nature of society. However, those classics which have endured over time are likely to reflect the heritage and society of past ages, and are valuable for the study of history as well as for the potential enjoyment of the narrative. The classics
should not be thought of as being “a list of specially chosen great books which represent an unchanging heritage,” (Meek, 1991) but as books which can be enjoyed and which have a certain place within the core of literature. It can therefore be argued that the classics are worthy of being conserved and taught more pointedly.

If we do accept the literary and societal value of classics, and include them as part of the general body of literature recommended for reading, an interesting issue is: how can children be encouraged to read the classics if they consider this an onerous task and do not like what they see in hard copy? This question is addressed by Hobson et al. (1992) in the section of their book devoted to classics, where they consider the problem of these texts not appealing to potential readers:

“At a time when reading standards have apparently dropped to a record low, and recognising such books are by no means easy to read, it is imperative that attractive editions continue to be made available. Too many editions are dull and difficult. Books have so much competition for children’s attention, and to stand a chance of winning must be of a high standard.” (p 205)

This point is supported by the findings of a study by the Children's Literature Research Centre (1994), which found that the “cover design - picture, title and blurb - is the most important factor influencing the choice of reading matter” for children. This suggests that the external appearance of the book is important to children, and the authors of the study associate this with the high level of visual literacy amongst the children of the present time, which has been discussed previously: “...for youngsters growing up in the closing decades of the twentieth century, visual literacy ... continues to be extremely important.” (p 112)

Indeed, the dominance of media other than print raises the issue of children being exposed to the classics through adaptations on the television, on video and at the cinema. If children’s knowledge of the classics is built purely on seeing the story in media other than print, then their knowledge of the story will be influenced by the interpretation put on it by those adapting it. Moreover, a literary work which appears in a form or forms other than the
original printed version becomes a different work of art. A child who experiences a literary work in an alternative format will not encounter the style of writing and language used in the original book, and will be unlikely to be able to develop the characters in their own imagination.

An example of the confusion caused to children by experiencing the classics through media other than print can be seen in Keady (1995). This study, which concerned an evaluation of a CD-ROM version of Lewis Carroll’s Alice’s Adventures in Wonderland, considered classic stories which the participants had read, seen on television, and seen on video or at the cinema. Various texts which are not included in Table 4.1 were cited, for example, The Incredible Journey (1961) — printed book, The Snowman — television, Hook —video and Bambi — cinema. It was particularly noticeable that the children seemed to associate Walt Disney with the classics, thinking that he created many of the stories which have been adapted by him and his company; and conversely, that Disney stories such as The Lion King (1994), which have not been adapted from original printed sources, are classics. Keady’s study also highlighted the issue of whether fairy stories can be considered to be classics. They are texts which have stood the test of time, and Winfield (1986), for example, includes Mother Goose, Little Red Riding Hood and Sleeping Beauty in his discussion of classics. Since fairy stories have often been produced in film versions by Walt Disney, and the children associated Disney with classic stories, Keady found that this seemed to lead to children believing fairy tales were classics. This was evident when some of the children put forward Beauty and the Beast, Cinderella, Sleeping Beauty and Snow White as classic texts — these are all fairy tales which have been adapted by Walt Disney into animated films. However, because of the general disagreement on a definition of the classics, it is hardly surprising that general confusion on this matter exists.

In whatever order children experience the classics, however, the important point is that they should be aware of the original text and should be able to tell the difference between this and the adaptation. Children will then be presented with the choice, and as suggested by Waterland (1989) will have the chance to experience, for example with reference to Winnie-the-Pooh, the difference between the “author’s intentions” and the “glossy images of Walt Disney”.

60
4.4 The potential for electronic versions of classic books

At a time when visual literacy is so dominant, it has been suggested that printed books do not appeal to children as much as they once did (Livingstone and Bovill, 1999). As discussed in Chapter 3, the additional elements offered by the electronic book could render it attractive to all young readers, but particularly to those for whom visual literacy is important. Increasing numbers of electronic versions of classic texts are becoming available, and might have the power to encourage children to experience these works. Indeed, as already noted in Chapter 3, given the idea that television and film adaptations of the classics encourage readers to return to the original texts (Bradman, 1995; Children’s Literature Research Centre, 1996), and vice versa (Waterland, 1989), it is possible that electronic books will have the same effect. The electronic version of a book can offer a text which is fairly close to the original one, with the added extras available to the medium.

The electronic book offers an extra dimension in that it has the potential to include other media in addition to text on its pages. As a result, the electronic book can add more to the classic text and pictures in terms of animation, sounds, and a narrator (Kafai and Soloway, 1994). This can be seen as an antidote to the unreactive and static nature of the printed book, as it offers the reader the possibilities of interactivity. This interactivity is manifested in the form of, for example, the ability to return to a difficult word, to see an explanation of an unfamiliar word, the capability to play inside a story, and the inclusion of games. Other elements which may be offered are custom features, activities, supporting material, and facilities for allowing children to mark and write in the book.

A limitation of the electronic book might be considered to be that, by its very nature, the electronic version of a text will not be the same as the printed version. The extra dimensions will cause the difference and, indeed, will be the enticement to children. It will therefore be important to consider very carefully such elements as abridging, original illustrations, and so on in the transformation of a classic text into an electronic book.
4.5 Electronic books and the classics

Given the existence of the problems of misconception about the classics discussed above, it seems important to consider the question of whether electronic books can help to overcome them. Indeed, Keady (1995) found that the responses of the children in her study indicated that they might be encouraged to read classics more often through exposure to electronic books on CD-ROM. If electronic books present the text and illustrations as close to the original as possible, then this should remove the difficulty of children exposed to the interpretation of a work by those adapting it for television and cinema. Furthermore, this should preserve the style of writing and language used in the original book, helping children to develop the characters in their own imagination. This is also important with regard to original illustrations, since many classic texts have depended on their illustrations for fame and lasting impact. This can be seen in the case of John Tenniel’s illustrations for Alice’s Adventures in Wonderland and for Through the Looking Glass (1871), which have become inextricably linked to the text (Darton, 1982). Any extra functionalities offered by the electronic book which impinge on the illustrations should therefore be used with care. In addition, electronic books can help in clearing up problems about the original creators of texts, since the authors tend to be given quite a high profile with these products. For example, the CD-ROM version of Journey to the Centre of the Earth used in the study described in Chapter 6 has an easily accessible screen of information about its author, Jules Verne.

The idea has been discussed above that children see the classics as being rather long and difficult to read. The facilities offered by electronic books, such as the ability to click on words in the text and have them read out again and the ability to see explanations of uncommon terms, could act as an encouragement to children to read classics. Such facilities could help alleviate the problem of “hard” words and could prove to be of great benefit (Greenlee-Moore and Smith, 1996; Miller et al., 1994). Furthermore, the long and difficult nature of the classics has led to abridged versions being introduced especially for children. Certain texts, although suitable for some children in their original form, have therefore been abridged to make them more widely accepted. A prime example of early adaptation is found in Gulliver’s Travels, abridged from its earliest publication in the form of
"chapbooks", which led to a wider and younger readership (Kinnell, 1995). A more modern example of the adaptation of texts is found in the Ladybird series, which demonstrates attempts to introduce classics in abridged form. It can be argued that such versions of classics make them more accessible to readers, in terms of language, references, price and commerciality. However, some might argue that the texts do not need to be made more accessible in these ways, and that attempting to do so is making false assumptions about young readers. That is, adapting classics implies that children's responses to literature are "crude", rather than "subtle and variable" (Hunt, 1991). These opposing views demonstrate a conflict within children's literature. However, in the age of the television generation, when children are said to be losing their desire to read, this conflict is to some extent dissipated by the wish of parents to encourage their children to read, whatever the subject matter might be.

Electronic versions of texts are often abridged. Waterland (1989) suggests that the parts omitted from an abridged text might be seen as "extras", available to children as they move on to the original version. In the case of electronic versions, they could certainly be seen as rewards for those children who go on to read the original texts.

As has been discussed, children often consider the classics to be an unattractive prospect for reading. Some further encouragement, for example, being read aloud by parents, teachers, librarians or other adults is therefore needed. Waterland (1989) describes reading “literary classic(s)” to a group of 6 and 7 year old children, and discovering, although using rather subjective measures, that classics such as Winnie-the-Pooh, The Wind in the Willows (1908) and The Lion, the Witch and the Wardrobe (1950) have the power to appeal when read aloud to the children. She suggests that this is likely to be true for children in general. Hence, audio is a dominating feature of the electronic book, and the provision of a spoken presentation of the text within it should have the power to engage children.

Small publications sold by itinerant pedlars or chapmen. Their subject matter was varied, and not confined to works which are now considered part of children's literature. They were designed to attract customers, so illustrations were an important feature, although their style and appearance were of inferior quality (Thwaite, 1972).
Chapter 4: The Role of Children's Classics in the Electronic Medium

As has been discussed, a significant disadvantage of electronic books is concerned with the difficulty of gaining access to them. Computer equipment is costly, which means that children from lower-middle class and poor families, who make up the majority of the population in most countries, are unlikely to be able easily to obtain the necessary access at home. It can therefore be seen that there are issues of social class associated with the electronic media. Furthermore, social class also plays a role with regard to the classics, as shown by a previous quotation from Waterland discussing the limited experience of these texts exhibited by children from an inner city school. Waterland implies that these children are likely to be from lower-middle class and poor families, and Meek (1991) states that there is “Irrefutable evidence that in primary schools poor children tend to be less successful at reading” (p 10). It can be argued that children from these families can obtain access to printed books from public libraries. However, this may not be so easy with regard to electronic media, since at the present time these products are not widely available, either for reference or for loan. It is therefore interesting to reflect that if such children can obtain access to electronic media, they are unlikely to want to read the classics on them.

4.6 Conclusions

Although critical opinion suggests that classic stories are of great value to children, there is currently a general lack of knowledge of these works. Indeed, a widely held image amongst children of the classics in hard copy seems to be that they are long and difficult to read. Among today’s children, there seems to be more awareness of the classics derived from media other than print, and perhaps from abridged versions presented in the print medium, leading to misconceptions about the texts. The present discussion has suggested that electronic books might have the power to bridge the gap between print and other media, as has been argued by reading experts. Research investigating the role of modern media in education and reading is limited, and therefore this Chapter takes the form of a discussion only. However, it can be seen that this issue merits further research. If the electronic book can bridge the gap, it will introduce children to the classics in a form which is closer to the original text. This might, in turn, also encourage children to return to the primary text, thereby experiencing the style of
writing or language used in the original book, and being more aware of the author's original intentions.

The idea that many children are not attracted by classic texts and are therefore not reading them has been examined at length within this Chapter, with electronic versions being investigated as a possible answer to this problem. However, it is also worth taking into account that there are some authors whose work many children do enjoy reading. An examination of what makes these authors popular might aid in encouraging children to read more, and the following chapter of the thesis will discuss this issue in depth.
Chapter 5: Author Popularity: an Investigation of One Children’s Writer

"A well-loved author can become a comfort blanket."
Hall and Coles (1999 p54)

5.1 Introduction

The previous Chapter has discussed classic texts, and the fact that these have a particular importance placed on them by society as represented in the main by teachers, critics, educationists, librarians, and parents. The Chapter also considers the notion that many children are not attracted by classic texts and are therefore not reading them. The proposition that there has been a decline in reading amongst children has also been discussed in Chapter 2 of the thesis.

There are, however, certain authors whose work children vast numbers of children continue to enjoy, for example, JK Rowling and Roald Dahl. If children are to be encouraged to read, it would be of benefit to know why children prefer such authors as these that they do choose to read. It follows then, that an interesting question to pose is: what is it that makes authors popular? If this question could be answered successfully, it would be possible to specify and describe what children like about certain authors. This would aid in the production of books which children are more likely to want to read, and might encourage them to read more. This could apply to the production of both electronic and printed books, the former being particularly relevant to the central focus of the present thesis. Identifying what children like about a certain author would enable the incorporation of the desired elements into electronic books thereby encouraging children to read such books.

Protherough (1983) comments that “There has been a great deal of work on what children enjoy, their favourite authors and titles and topics, but little on why they have these preferences.” (p3) This sums up the position now as well as it did back in 1983 when Protherough wrote this. It is particularly true that this issue has not been investigated with the involvement of the children themselves.
Roald Dahl is an interesting case of a very popular author (1916-1990), who has had overwhelming success with his work for children and who is often considered to be a writer of modern classics (see Chapter 4). Evidence of Dahl's popularity with children can be seen by looking at his sales figures (Sykes, 1990; Taylor, 1991; Reynolds, 2000) - and by his success amongst library users. Listed as one of the 14 authors having over one million loans during 1997-98 (LISU, 1999), Dahl was also placed at number three of the 10 most borrowed children's authors (over 1 million loans) in the period July 1998 - June 1999 (Public Lending Right, 2000). Perhaps more importantly, Dahl's popularity is illustrated by a survey carried out by the section of a British national newspaper aimed at younger readers, called the Young Telegraph (1993). The newspaper asked its readers to write in with details of their favourite books, therefore attempting to discover the opinions of children themselves about the books they like to read. As a mark of the popularity of Dahl, the survey found that 8 of the top 10 titles, including all of the top 5, were written by him. These figures represent a strong indication of the preference for Dahl as shown by children through their own publication, showing that they do read and enjoy the books. A second illustration of Dahl's success with children can be found in Young People's Reading at the End of the Century (Children's Literature Research Centre, 1996), a study which investigated the reading habits of British children of present times. In answer to a question about favourite story books, the study found that, for children aged 7 to 11, the top six were Dahl titles, and for children aged 11 to 14 and 14 to 16, six of the top ten titles were written by him. Other categories placed Dahl as a strong favourite with young readers.

There are several indications of Dahl's popularity in surveys of children's reading habits, for example, Hall and Coles (1999), a 1997 survey carried out by the BBC Bookworm programme (in conjunction with Waterstones the booksellers) and referred to in Hall and Coles (1999). Dahl was also placed first in a poll to find out the "nation's favourite modern children's author" (Library Association Newsletter, 1997). The poll was carried out by the BBC Radio 4 programme, Treasure Islands, and both children and adults were eligible to vote. See Appendix 5.1 for further details of the poll result, announced in December 1997. The most recent illustration of children's abiding affection for Roald Dahl came on World Book Day, Friday March 10th 2000 (Ezard, 2000). Ten years after his death, Dahl topped a nationwide poll of 40,000 people to determine Britain's favourite author. Carried out at 4,000
bookshops and libraries, in schools and on the Web, the results of the poll were weighted towards the book-buying tastes of young people.

As detailed in Chapter 6, the participants to the study described there were asked if they enjoyed reading Dahl's books, and 26 of the 30 (87%) said that they did. Furthermore, three of the participants were reading one of Dahl's books at the time of the experiment (see Table 5.2). This demonstrates his popularity and significance to young readers in a realistic, albeit small scale. All of the above demonstrates that Roald Dahl is extremely appropriate to act as the subject of a study investigating author popularity. It is recognised that if this study was to be undertaken at the present time, JK Rowling would also be eminently suitable. However, this study was carried out before her great success occurred.

It should, perhaps, be borne in mind that popularity is not necessarily an accurate indicator of quality, and this has led to various critical considerations of Dahl. Many of the critics show themselves to be quite opposed to Dahl's work (e.g. Cameron, 1976; Itzin, 1985), and discuss their opinions of various themes of Dahl's work, for example, sexism (Itzin, 1985), violence (Columbo, 1993) and racism (Culley, 1991). A general consensus which can be found in considerations of Dahl is that he is extremely popular with children, but not always so esteemed by adults (Petzold, 1992; Campbell, 1981; Merrick, 1975; Watkins and Sutherland, 1995; Hall and Coles, 1999). Furthermore, if this is the case, and adults generally find Dahl less than loveable, then the fact that critics are themselves adults might explain their broad dislike of Dahl's work. Hall and Coles (1999) are generally positive about Dahl and suggest that his success may derive from elements such as the appeal of his disturbing outlook, the use of rude words and noises, the inclusion of humour and wittiness, his unfussy prose style, the fast-moving plots, and identifiable character types. The inclusion of plenty of dialogue, and a narrative voice close to the child's situation, combined with the incorporation of a child-centred world which deliberately excludes adults, particularly parents, are also considered by Hall and Coles to be key to the popularity of Dahl.

However much the critics might attempt to analyse the work of Dahl, though, they are not the buying public, and it is children and parents or other relatives who purchase the books. Indeed, an anomaly can be seen with reference to the conflicting views about Dahl of children and adults, in that it is the
Chapter 5: Author Popularity: an Investigation of One Children’s Writer

children who are likely to want the books, but that it is their parents who will mostly have the buying power (Children’s Literature Research Centre, 1996). However, in the age of the “television generation”, when children are said to be losing their desire to read, this conflict is to some extent dissipated by the wish of parents to encourage their children to read, whatever the subject matter might be. Roald Dahl himself understood the importance of reading and saw his own books as “introductions to the idea of books in general” (Appleyard, 1990).

Whatever the views of adults, the fact remains that Dahl is popular with young readers, and it is the case that little work has been carried out into why children enjoy his work. Certain of the various discussions of Dahl’s work do incorporate some discussion of the reasons for his popularity (e.g. Hall and Coles, 1999), but few exhibit the involvement of the children themselves in getting to the heart of this issue. In his discussion of Dahl’s suitability for children, Culley (1991) mentions, almost in passing, a questionnaire he gave to children aged from six to eleven years, however, no details of investigating Dahl’s popularity are given. Scott (1991) wonders why teachers use Dahl’s work in the classroom, concluding that it is because he is the class favourite, which seems to be rather a circular argument. She then goes on to outline how she asked two 10 year old children to explain to her why they liked Dahl. The children are able to mention such characteristics as exaggeration, effective description, unusual ideas, and extraordinary words as reasons for enjoying Dahl’s books. However, this contribution from the children themselves is somewhat limited.

One study which sets out to find out the secret of Dahl’s popularity from children themselves is by Gouws and Bester (1995), who undertook empirical research in South Africa in order to answer this question. A questionnaire was designed which concentrated firstly on Dahl’s work in general, and then more specifically on six chosen texts - Revolting Rhymes (1982), Dirty Beasts (1983), Matilda (1988), The Witches (1983), Esio Trot (1989) and The Vicar of Nibbleswicke (1990). Gouws and Bester drew the conclusion that "the very characteristics that offend adult critics make the books appealing to young readers."

However, the questionnaire method of eliciting views necessarily leads to a certain amount of influencing of the responses given through the selection of subject matter and language used by the compiler. To this end, attempts were made to enrich the data gathered by requesting respondents to provide
motivations for their answers, but an added problem could be seen in that children might be considered to be particularly open to suggestion.

This apparent lack of involvement of the readers themselves in the study of Dahl's books for children points to a gap in the research on this subject. It was therefore decided that a study investigating the popularity of Roald Dahl should be designed which took into account the opinions of young readers with regard to his work. It was hoped that investigating such an exemplary example of a popular author would allow for a satisfactory investigation of the components of author popularity and help in the design and production of electronic books for children. The repertory grid technique was identified as an effective method for such a study, since it is a content-free methodology, which would enable the participants to use their own terms when considering Dahl texts.

5.2 Use of the Repertory Grid Technique

The repertory grid technique was developed by George Kelly (1955) as part of Personal Construct Theory, which takes the position that humans are basically "scientists" and mentally "represent" the world, composing and testing hypotheses about the nature of reality (Dillon and McKnight, 1990). See Kelly (1955) for a more detailed account of the theory.

The repertory grid technique is no longer linked exclusively to Kelly's theory of personal constructs, because it has been used for a variety of applications, including, for example, investigating the personal meaning of death (Meshot and Leither, 1995), local attitudes towards tourism development (Mansfeld and Ginosar, 1994), and definitions of emotions (Parkinson and Lea, 1991). The terms coined by Kelly for the repertory grid technique have become standard, so the technique is conventionally described as consisting of "elements" which are rated according to particular criteria called "constructs". Once a participant has been exposed to the technique, the output will be a grid in the form of rows and columns, which record a participant's ratings, usually on a five or seven point scale, of a number of elements in terms of a number of constructs.
Constructs are elicited by presenting the participant with a set of elements, for example, various popular songs they have heard. Asking the participant to compare and discriminate between the songs leads to the generation of a bipolar dimension - this is the construct. Employing the minimum context form (Bannister and Mair, 1968) to elicit the constructs involves presenting participants with three of the elements – this is called a “triad” – and asking them to think of a way in which two of the elements are similar and consequently differ from the third. Continuing the example concerning popular songs, a participant might be presented with the three elements Yesterday (1965), White Christmas (1942) and (Somewhere) Over the Rainbow (1939). The participant might generate the construct "makes me feel happy - makes me feel sad". The construct can then be used to rate the remainder of the popular songs under consideration. An impression of the participant’s opinions and interpretations of a subject emerges through the elicitation of more constructs, and the rating of all elements according to these constructs.

The advantage of the repertory grid technique lies in its emphasis on subjective evaluation presented in a form which is easily accessible to statistical manipulation. The technique was therefore selected as a suitable method for the present study, since it was thought important to discover the opinions of the young readers in their own language. As a content-free methodology, the repertory grid technique enabled the children to be free to use their own terms when describing the constructs.

This present work is seen as being an explorative study, due to the fact that it is possible to carry out the repertory grid technique on only a small number of participants. This is because the most effective method of analysis of the technique is by computer, and the program which carries out the analysis is unable to cope with large numbers of participants. In addition, it is hard to compare across participants unless they are all presented with the same elements. In the case of using children as participants, it would be difficult to ensure that they had all read the same texts, so a limited number of common texts had to be applied. The present study does, however, represent a first step towards acquiring ideas about Roald Dahl's work in children's own terms.
5.3 Method

5.3.1 Participants

Six children (three male and three female) participated in the study. One of the male participants was aged twelve years, with the remainder of the participants all being aged ten years. Three were the children of friends of the experimenter, and the remainder were from a local primary school.

5.3.2 Elements

The elements in the present study took the form of books, or, in a few isolated cases, other forms of reading matter such as comics. Since the participants were being compared, it was necessary to ensure that some elements were common to all individuals, and to ask the participants to describe their own constructs. To this end, three Roald Dahl texts were selected as common elements. The Young Telegraph survey (1993) was identified as an appropriate source for the likely favourite texts of the children, since these titles were chosen by young readers, and the work of Dahl was featured heavily. The top three works distinguished by the survey were texts written by Roald Dahl, and were used as the common elements. They are as follows:

1. Matilda (1988)
2. The Witches (1983)
3. The BFG (1982)

Attempts were made to ensure that all of the children who participated in the study had read these books. However, it proved difficult to find enough children who had read all three, so of the participants involved, two had read the text of two of the works, and had seen a film adaptation of the third.

5.3.3 Procedure

Each participant was taken separately to a quiet room for the elicitation of grids. Prior to the experiment, the participants had been asked to think of six
additional texts which they knew well. One of the participants had problems thinking of six further texts, so in his case only five were used. These titles were needed in order to act as the remaining elements with which to elicit a grid. Each of the elements was written on record cards for presentation to the participants. Before the technique was administered, the participants were given a brief introduction to the idea behind the study.

The minimum context form discussed above (Bannister and Mair, 1968) was employed to elicit the constructs, so participants were presented with a triad from a list which had been prearranged in order to ensure that no pair of elements recurred (see Appendix 5.2). Once presented with the triad, the participants were asked to think of a way in which two elements were similar and consequently differed from the third, thereby generating the construct. For the children considering nine elements, ten triads were presented, and for the child considering eight elements, six triads were presented. It was hoped that participants would generate one construct for each triad, however, it was understood that difficulties might be experienced with some triads, due to the participants being children. It was therefore made clear to the children that, if they had problems, the experimenter would go on to the next triad. This proved to be necessary in some instances.

Once a satisfactory construct had been achieved, its two poles were written on a record card and placed on a flat surface on either side of a five point rating scale. Participants were then asked to rate all the texts, physically placing the record card on which the titles were written at the relevant point on the rating scale according to their evaluation of each text in relation to the two extremes of the construct. Participants were asked if they wished to change the position of any of the texts before their ratings were noted. The experimenter then introduced the next triad for consideration, and the process continued until there were no triads remaining.

5.4 Results

The data were analysed using the RepGrid version 3 program, a repertory grid elicitation and analysis package for the Apple Macintosh computer (RepGrid, 2000). The analysis resulted in the elicitation of one focused grid for each participant. As discussed above, it was intended that the responses of
the participants to the common elements would be compared. An illustration of this can be seen, for example, in Dillon and McKnight (1990), where the individual grids of all the participants have been analysed together as one large grid, allowing for comparisons between all of the elements and all of the constructs produced by the study. This was possible because all of the elements presented to the participants in this study were identical. For the current study, a focused grid consisting only of data relating to the Dahl texts was produced, in an attempt to isolate the relevant findings and complete a similar comparison. However, as a result of the limit on common elements, this produced a grid (see Appendix 5.3) which demonstrated a scarcity of variance between the ratings, since there were too many constructs (50) compared to elements (3). As a result, no meaningful results were generated, so each participant's focused grid has been analysed separately, and these are presented in Appendix 5.4.

The grids consist of the list of elements along the top, and the list of constructs below, the main body being made up of the ratings produced by the participants. The computer program has reordered both lists in order to show the minimum distance between related element and construct rating columns, and dendrograms have been created by joining elements and constructs at their appropriate matching levels. As can be seen from Figure 5.4.1, for example, the construct dendrogram has been placed above, with the element dendrogram below, and both are to the right of the reordered ratings. The matching levels are shown on adjacent scales, where high matches indicate that elements share similar ratings on the majority of constructs, or vice versa. Consequently, again using Figure 5.4.1 as an example, it can be seen that elements 4 (The Witches) and 3 (The BFG) are highly matched, while element 1 (Matilda) is the least similar to the remaining elements. This type of matching may also be carried out on the construct dendrogram, making it possible to build up a detailed picture of how each participant interprets their chosen texts.

5.4.1 Constructs

The focused grids for each participant presented in Appendix 5.4 show that the analysis revealed many different relationships between constructs. Of particular note was that all six had elicited either the construct "funny - not
funny" or "funny - serious", these clearly having very similar meanings. In addition, five of the six participants elicited the construct "scary - not scary". This suggests that these two themes were commonly held to be significant by the participant when considering reading matter, and it is interesting that these ideas, particularly that of humour, have been discussed by various critics as reasons for children's liking for Dahl (e.g. Gouws and Bester, 1995, and Culley, 1991).

It must be remembered, however, that each reader had their own particular set of elements and placed each of the texts, including the common Dahl works, at different points on their self-appointed scales. This is shown in Table 5.1. It should be noted that during the analysis of the data, the computer program may reverse constructs which have been entered, in order to make the best match between elements. For example, Figure 5.4.2 offers the scale "scary - not scary", although the elements were rated by the participant according to the scale "not scary - scary". This has also altered the ratings given, with number 1 becoming number 5, number 2 becoming number 4, and so on. In order to make comparison across individuals more effective, Table 5.1 presents the scales and ratings as they were originally submitted by the participants.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Text</th>
<th>Scale Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious/not funny - funny</td>
<td>The BFG</td>
<td>3 3 4 3 2 3</td>
</tr>
<tr>
<td></td>
<td>Matilda</td>
<td>4 2 5 2 3 3</td>
</tr>
<tr>
<td></td>
<td>The Witches</td>
<td>2 1 4 2 2 2</td>
</tr>
<tr>
<td>Not scary - scary</td>
<td>The BFG</td>
<td>- 3 1 2 2 2</td>
</tr>
<tr>
<td></td>
<td>Matilda</td>
<td>- 2 1 1 1 2</td>
</tr>
<tr>
<td></td>
<td>The Witches</td>
<td>- 4 3 3 5 4</td>
</tr>
<tr>
<td></td>
<td>Participant</td>
<td>1 2 3 4 5 6</td>
</tr>
</tbody>
</table>

Table 5.1: Scale positions of common Dahl texts

It can be seen from Table 5.1 that the children's individual opinions were very much in evidence in the study. Dahl was not always considered scary, nor was he always considered funny. With regard to the construct "serious/not funny - funny", most of the children showed ambiguous feelings about The BFG, with four out of six placing it in the centre of the rating scale. There were very varied feelings amongst the participants about the nature of Matilda in this regard, and The Witches appeared to be considered more serious than funny, with five out of six participants placing it towards the serious side of
the rating scale. In the case of the "not scary - scary" construct, the greater proportion of the children considered that both *The BFG* and *Matilda* were not scary, whereas it appeared that most of the readers found *The Witches* frightening.

In addition to the themes of funny and scary, there were other constructs elicited by the participants which concentrated on similar issues. These included the involvement of animals, the inclusion of cartoons, and the involvement of children, which were picked out by two participants; enjoyment, which was noted by three participants; and lastly, observations about the characters as well as opinions about the story or plot, which were both indicated by four participants.

### 5.4.2 Elements

It is valuable to concentrate particularly on how closely the Dahl texts are matched on the element dendrograms for each participant (see Appendix 5.4). If the Dahl elements match particularly closely, the participants are likely to be considering the works as similar to each other in particular ways, and different from the remaining texts. In addition to the three stipulated Dahl texts, all six participants selected at least one other text by Dahl as one of their chosen elements. The additional Dahl texts were as follows: *Esio Trot* (1989), *The Twits* (1980), *Charlie and the Chocolate Factory* (1964), *James and the Giant Peach* (x2) (1961), *Fantastic Mr Fox* (1970), and *The Vicar of Nibbleswicke* (1990). Five readers selected one additional Dahl text, and the remaining participant (number 5), selected two further Dahl works among his personal elements. Since this was the child who had eight rather than nine elements to consider, it meant that five out of his eight elements were works by Dahl. This concentration on the works of Dahl might be an indicator of his popularity, but might also be because the children were aware that the study was focusing on this particular author, and so felt obliged to choose further texts by him. The analysis of each participant in this context is given below:
Chapter 5: Author Popularity: an Investigation of One Children's Writer

<table>
<thead>
<tr>
<th>Participant</th>
<th>Match of Dahl Texts</th>
</tr>
</thead>
</table>
| 1           | The Witches and The BFG very close (90%)  
Matilda least like all of the other elements, including Dahl texts  
Esio Trot joins The Witches and The BFG at 80% |
| 2           | Matilda and The BFG close (79%)  
The Witches fairly close (72%)  
The Twits very separate from common Dahl texts |
| 3           | Three common texts very separate  
Charlie and the Chocolate Factory joins Matilda at 83% |
| 4           | Three common texts join at 73%  
James and the Giant Peach joins Matilda at 80%, and joins The BFG and The Witches at 72% |
| 5           | Three common texts join at 72%  
Five Dahl texts cluster above 70%, and look completely separate from remaining 3 texts. The BFG and Fantastic Mr Fox particularly close at 95% |
| 6           | Matilda and The BFG close (82%)  
The Witches completely separate  
The Vicar of Nibbleswicke separate from other Dahl texts |

Table 5.2: Match of all Dahl texts for all participants

The results in the table suggest that, as would be expected, the children had their own very individual opinions about books by Roald Dahl. Participant 1 matched Esio Trot highly (80%) with The Witches and The BFG, which were already matched very highly at the level of 90%. The results for participant 2, however, did not join The Twits closely with the common texts, which were themselves linked closely (above 70%). Conversely, participant 3 placed the common texts very separately, but showed a high match between the additional text, Charlie and the Chocolate Factory, and Matilda (85%). Participant 4 connected the common texts fairly highly at 70%, and joined the additional text with two of these at the 70% level, with the third (Matilda) matching particularly closely at 80%. The results obtained for participant 5 found that the five Dahl works clustered together above 70%, and were completely separate from the other three texts, which also grouped together above 70%. This participant also made a particularly high match between The BFG and Fantastic Mr Fox, at the level of 95%. Finally, the additional text selected by participant 6 did not connect closely with any of the three common texts, only two of which were closely matched themselves, at the 80% level.

These results indicate that four out of the six participants matched at least three Dahl texts above the level of 70%, suggesting that they considered that these works exhibited certain qualities in common. It seems important to highlight the results of participant 5, in which the five Dahl works clustered together above 70%, and were completely separate from the other three texts, which also clustered together above 70% (see Figure 5.5). This suggests that
participant 5 found the Dahl texts to be very similar in nature, and different from the other three elements under consideration.

Since the sample and therefore the amount of elements employed for this study are both small, it is not likely that a survey of common authors and features among the elements selected by the children and not written by Dahl will yield much information. Some such characteristics were noted, however, and are shown in Table 5.3. It should also be noted that readers tend to like books of similar style by different writers.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartoons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td><em>Calvin and Hobbes</em></td>
<td>Bill Watterson</td>
</tr>
<tr>
<td>1</td>
<td><em>The Far Side Collection</em></td>
<td>Gary Larson</td>
</tr>
<tr>
<td>6</td>
<td><em>The Beano</em></td>
<td>(Comic)</td>
</tr>
<tr>
<td>Same author</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><em>The Ghost Next Door</em></td>
<td>R.L. Stine</td>
</tr>
<tr>
<td>6</td>
<td><em>Piano Lessons Can Be Murder</em></td>
<td>R.L. Stine</td>
</tr>
<tr>
<td>6</td>
<td><em>Welcome to Camp Nightmare</em></td>
<td>R.L. Stine</td>
</tr>
<tr>
<td>1</td>
<td><em>The Sheep-Pig</em></td>
<td>Dick King-Smith</td>
</tr>
<tr>
<td>6</td>
<td><em>Daggie Dogfoot</em></td>
<td>Dick King-Smith</td>
</tr>
</tbody>
</table>

Table 5.3: Common authors and features of elements not written by Dahl

It can be seen from Table 5.3 that common authors and features occurred across no more than two participants. It is noteworthy that two of the children chose texts by R.L. Stine from the Goosebumps series, a "horror fiction series aimed at the under-12s" which has proved to be a "publishing phenomenon in the US" (Cornwell, 1996). The series has become equally popular in Britain, and this is reflected by its being chosen by two out of the six participants (from the age group at which the books are aimed) from this study (see also Chapter 6). Furthermore, it is interesting to note that the arguments which are being put forward with regard to the Goosebumps texts seem to match the concerns which have been voiced about works by Dahl. That is, some parents and teachers argue that the Goosebumps stories contain dubious taste and plotting, while others are glad that children who usually prefer Disney videos or computer games are reading anything at all (Cornwell, 1996).
5.5 Discussion and Conclusions

As mentioned above, when comparing grids the repertory grid technique can only be carried out on a small number of participants, due to difficulties with analysis. This constraint on participant numbers, coupled with the limits of having only three common titles, means that the study can only be seen as a "first step" towards a clearer understanding of children's liking for works by Roald Dahl. However, the study can be seen to have attempted to discover the opinions of the readers themselves by speaking to children, rather than simply considering the views of adults.

It can be concluded from the study that, for the most part, the participants involved in the study, who were simply required to have read certain of Dahl's books, also enjoyed them. This could be surmised from comments made by the participants to the experimenter during the study, and from the fact that all of the participants chose at least one further Dahl book in addition to the compulsory ones. This enjoyment of Dahl, and the fact that two of the children chose texts from the Goosebumps series, reinforces the idea that children themselves do not have the same concerns when choosing their books as the concerns adults have when selecting reading material for them. This should be borne in mind by those producing electronic books for children.

The results regarding the matching between common Dahl elements, and between these and the additional Dahl texts did suggest that some qualities and characteristics were found in common between works by Dahl by a majority of the participants. This appeared to be particularly noticeable in the case of participant 5, whose eight elements included five Dahl texts, the latter clustering together above 70%, completely separately from the remaining elements.

All of the participants elicited the constructs "funny - not funny" or "funny - serious", and five of the six participants elicited the construct "scary - not scary". Since the children were considering other books in addition to those written by Dahl, these constructs were generated from their opinions about reading material in general, rather than simply about Dahl. However, this certain level of agreement between participants does seem to present the idea
that they were generally thinking in a similar way, and considered the two themes of humour and scariness to be particularly significant. This is of significance to the writers and producers of electronic books for children.

The children did not think that books by Roald Dahl were either always funny or always scary. When considering the common Dahl elements with regard to the theme of humour, it is difficult to make any generalisations, since each child placed the texts at different points on the scale. This seems to correspond with the idea that humour is individual, even at the comparatively young age of the participants in this study. In the case of scariness, however, there appeared to be more of a consensus amongst the children, with the greater proportion considering The Witches to be scary, and both The BFG and Matilda to be not scary.

Therefore, it can be argued that the study has highlighted that Dahl texts do have some characteristics in common, rendering them different from other books. The definition of exactly what these characteristics are might help to explain the popularity of Dahl, and this study has been partially successful in contributing to this definition. It is clear that further work is required and the gap in the research still exists. Recommendations for future work on this matter should consider a further repertory grid study which stipulates a greater number of common elements. The more preferable approach would involve a refinement of the questionnaire described by Gouws and Bester (1995), using the constructs generated here as the basis for the questions. This would take this research a step further whilst allowing for more quantitative data to be obtained. Although young respondents are considered to be particularly open to suggestion, using constructs already elicited by children could avoid a situation in which the selection of subject matter and language used by the questionnaire compiler has an excessive influence on the participants.

If we do encourage children to read electronic books, what effect might this have on their reading, and in particular on their comprehension of the book? Concerns have been expressed about the effect of the electronic medium on children’s comprehension of electronic books. This issue will be investigated in the next Chapter in a study of user interaction with electronic books which compares children reading an electronic text with children reading the same text in two different printed formats.
Chapter 6: Young Readers’ Interactions with Electronic Books

"‘and what is the use of a book,’ thought Alice, ‘with pixels but no pagination?’"
(Finn, 1999 p XI)

6.1 Introduction

As discussed above, because it represents the combination of the advantages of the printed book (particularly its universal interface), with the capabilities of the computer, the electronic book can add more to the text and pictures in terms of animation, sounds, and a narrator (Kafai and Soloway, 1994). This may render the electronic book attractive to children, in particular those for whom visual literacy has become very significant. It has been argued, therefore, that electronic books might have the power to bridge the gap between print and other media, and thereby encourage those children who are reluctant readers (Adams, 1986; Balajthy, 1988; Jacobson, 1992; Meyer, 1994; Chu, 1994; Meakin, 1997). However, if children are either encouraged to read electronic books, or choose to read them more and more, how do they compare with printed books? Concerns have been expressed with regard to children’s comprehension of electronic books as compared to their comprehension of printed ones, due to the added attractions included in the former (e.g. Talley et al., 1997). The view has been expressed that children will be so interested in the pictures, animation and computer effects that the text itself will be largely ignored (Graham, 1994). Conversely, it has been argued that the special effects have an initial attraction which quite quickly wears off, leading to children ultimately treating computer books as printed books (Chu, 1995).

A search through the relevant literature finds little or no evidence of the ability of electronic books to encourage reluctant readers. It also reveals a lack of understanding regarding children’s comprehension of electronic story books, which points to a gap in the research on this subject. A study by Greenlee-Moore and Smith (1996) did investigate the effects on reading comprehension when reading narrative texts of different length and complexity on the printed page compared to reading the same narrative
texts using interactive CD-ROM software on the computer. The study is limited in that it uses only children of above average ability, and that it was designed to compare different narrative text types. Indeed, the authors admit a need for further research into the effects of interactive software when reading narratives. This lack of knowledge on the subject resulted in a study being designed whose main aim was to ascertain to what extent children’s comprehension of an electronic text compares with their comprehension of printed media. The study involved comparing children reading an electronic text with children reading the same text in two different printed formats.

The method of testing the children’s comprehension which was chosen for this experiment was that of asking multiple choice questions about the text selected for study. It is acknowledged that it is difficult to test reading comprehension accurately, since the results obtained from asking questions about the content of a passage are likely to be affected both by the effectiveness of each participant’s memory, and by their ability to guess the answers. However, this method is widely employed as a comparatively effective means of testing reading comprehension (e.g. Greenlee-Moore and Smith, 1996), and so was utilised in the present study.

6.2 Method

6.2.1 Experimental design

The text selected for use in the study was *Journey to the Centre of the Earth* by Jules Verne (first published 1864). The text was chosen because it was thought that it is sufficiently lesser known to ensure that participants were unlikely to have read it previously, but that the story could provide enough interest to ensure that they would enjoy reading it. In addition, the text was suitable for the age range of the sample group, and an electronic version on CD-ROM (pub. Europress Software, 1997) was readily available. Three versions of the text were used in the study:

- the electronic book - a PC-compatible CD-ROM version of the story
- a print out of pages from the electronic version, bound together like a printed book
As discussed above, the electronic version of the text was presented on CD-ROM, and copies of pages from it can be found in Appendices 6.1 and 6.8. The book has written text surrounded by coloured pictures which are animated as the story is told. It has a narration and the text is highlighted as it is read (see Appendix 6.1 Page 16), together with various sound effects and background music. There are hypertext links which explain the more difficult words and concepts (see Appendix 6.7 Figure 12) and various examples of interaction. In particular, the electronic text includes “hot spots” (interactive details in the illustrations which respond in various ways when clicked on by a mouse) for entertainment value (see Figures 6.7.8 and 6.7.9 for examples), and the contents in the form of a map (see Appendix 6.8). The electronic Journey is opened up from an operating system by clicking on an icon which results in a representation of a printed book appearing to emanate from a bookshelf (see Figures 6.7.1 to 6.7.3 for an illustration of the electronic Peter Pan behaving in this way – the Journey to the Centre of the Earth text operates in the same way). The representation of the book then appears to open, revealing the contents page, which takes the form of a map (see Appendix 6.8). The book metaphor is in evidence in the electronic version of the text. The contents take the form of numbered chapters (see Appendix 6.8), and each screen of information is set out like the page of a book, having a white background with black text, and a turned-down corner to suggest the qualities of a printed page (see Appendix 6.1). A bookmark with a tasselled end, depicted in computer graphics, may be inserted to keep a note of a particular page (see Appendix 6.1). The menus are shaped liked printed books (see Appendix 6.8), and the graphics surrounding each screen or page depict an open book.

The print out of pages from the electronic book consisted of “screen dumps” from the CD-ROM, which were printed in colour, laminated and spiral bound together like a book. It was intended that the print out version of the story should take the form of a printed book but be as similar as possible to the electronic text with regard to illustrations and layout. This was intended to investigate the effect of including the same layout and illustrations as the electronic book, but without the animation.
and narration. See Appendix 6.1 for copies of the pages from the print out version of the story.

The text only version of *Journey to the Centre of the Earth* was made to look like a paperback book so that it would appear as familiar as possible to the participants (see Appendix 6.2). The text itself was taken from the electronic book in order to ensure that all three books were identical in terms of the words used to tell the story. In common with many electronic books, the CD-ROM *Journey to the Centre of the Earth* had been abridged, and so was not identical to any published printed version. It is recognised that any printed book of the story could have been used in the study. However, this would have caused difficulties when testing comprehension of the study, since it would have been hard to ask the same questions of all participants. Four chapters from the electronic book were therefore selected, comprising 16 pages and 2784 words, in order to direct the reading, and to enable the asking of specific multiple choice questions on content afterwards. Since the extract did not begin with the first chapter of the electronic book, a 399 word summary of the “story so far” was read by all of the user participants to help ensure that they would understand the context of the story which they were about to read. This also enabled the measurement of each participant’s reading speed. The summary is shown here as Appendix 6.3.

The study took the form of a factorial design, that is, each participant read only one of the three copies of the text. Following the reading, participants were asked to answer the same 20 questions about the story in order to gauge the level of comprehension they had gained from it. The multiple choice question format was selected as the most appropriate for the study, because it was decided that these could be answered simply and quickly by the children. The questions were assembled by the experimenter, and at least one question was derived from each of the sixteen pages of the text. One of the teachers of the intended participants was consulted about whether the level of difficulty of the questions was appropriate, and a pilot study was carried as an additional indicator of their suitability. The final list of questions is included as Appendix 6.4.

The order in which the multiple choice questions were asked was varied between participants. That is, half of the users from each of the three
groups were presented with questions in the same order in which the answers appeared in the story, and the other half were asked identical questions, but in random order. The order of the questions was varied as a means of observing whether this had an effect on the number of correct answers gained. The two question orders are shown in Appendix 6.5.

6.2.2 Sample

The group selected for this study comprised children aged from nine years and one month to ten years and nine months. These participants were chosen primarily because this age range matches that used in other research contained within this thesis, and it was thought that this similarity would be useful for the purposes of consistency and comparison. The participants were from two local primary schools.

Three matched groups of ten participants were identified, one group for each version of the text. The participants were matched according to gender (five male and five female in each group) and reading ability, the latter as measured by the participant’s schoolteacher. The NFER-Nelson Group Reading Test (1985), which was administered by the teachers, was used to measure reading ability. The test gives a standardised score, the average being 100. Group 1 was given the print out of pages from the electronic book, Group 2 the electronic book, and Group 3 the printed book version.

6.2.3 Experimental procedure

The experimental procedure for the versions of the story involving the printed book and printed pages from the electronic book was identical, and was as follows:

1. The participants were asked about their computer experience, experience of electronic books, experience of the chosen text, personal details, and their reading habits. Appendix 6.6 shows the questions which were asked of each participant.

2. The participant’s reading speed was established by directing them to read the summary of the “story so far”, and timing the reading.
3. The participant was given the book to read.  
4. The participants read the text, and this period was timed.  
5. The multiple choice questions on content were given to the  
   participants to answer. The multiple choice method of questioning  
   was explained where participants were unsure. Timing of the period  
   began as soon as participants had started answering the questions. No  
   time limit was set.  

The experimental procedure for the electronic version of the story was as  
similar as possible to that for the other two texts, except that it was  
necessary to ensure that the participants were familiarised with the  
manipulation of the computer and of the electronic book itself. As a result,  
before the participant’s reading speed was established through the reading  
of the summary of the story, they were shown an electronic book similar  
to the chosen text. This was Peter Pan (Barrie, first published 1902), another  
electronic book published by Europress Software. This text is from the  
same Living Classics series, and is operated in the same way as the  
electronic Journey to the Centre of the Earth. Both electronic texts were  
presented on the same Toshiba Satellite 200 CDS portable PC-compatible  
computer. The alternative text was shown to the participants in order to  
demonstrate its operation and added features. The children were  
familiarised with navigating around the book and with the narration,  
highlighting of text as it is narrated, sounds, hypertext and animation. In  
the case of the last, this involved both the animation which happens  
automatically while the text is being read, and the “hot spots”. Participants  
were given five minutes to familiarise themselves with the electronic text  
after the demonstration. Further details of the demonstration can be found  
in Appendix 6.7.  

Participants were then asked to read the summary of the “story so far”, in  
the same way as for the other two versions of the text. The next step was to  
give the electronic version of Journey to the Centre of the Earth to the  
participants to read, pointing out that this book worked in the same way as  
the demonstration text, with a map for a list of contents (see Appendix 6.8),  
etc. and that mouse control would be left entirely to the user. No further  
mention was made of the added features, in an attempt to avoid leading  
the participants in any way. Participants were told to read until asked to  
stop, in order to ensure they did not explore the whole book. Help was
given if participants were unsure of the electronic book and requested assistance. The remainder of the procedure was identical to that for the other two versions of the text (see points 4 and 5 above). Throughout each reading of the text, the experimenter observed as unobtrusively as possible by apparently carrying out unrelated work. The trials were carried out in the library of each of the two schools involved.

6.2.4 Pilot study

The pilot study involved testing the experimental procedure on four participants, two of these being exposed to the print out version of the story, and the other two being exposed to the electronic book version of the story. The experimental procedure was found to be appropriate in terms of the user group being studied, and with regard to the aims of the study. However, the multiple choice questions on content were too simple to answer, because all four user participants scored highly on them (≥15). In order to avoid a potential “ceiling effect” which would influence data analysis, the questions were revised to make them less easy to answer, and tested on a further six participants, two from each user group. The subsequent range of the number of correct answers was found to be acceptable, and so the revised questions were used in the final study.

6.3 Results

6.3.1 Reading scores

The mean, standard deviation and range of reading scores for each of the groups are shown in Table 6.1. The Table shows how reading scores were matched across conditions and participant gender.
Chapter 6: Young Readers’ Interactions with Electronic Books

### Table 6.1: Reading scores for the three groups

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Mean reading score</td>
<td>104.4</td>
<td>103.0</td>
<td>109.8</td>
</tr>
<tr>
<td>SD</td>
<td>12.42</td>
<td>12.08</td>
<td>15.19</td>
</tr>
<tr>
<td>Range</td>
<td>90-121</td>
<td>90-118</td>
<td>91-124</td>
</tr>
<tr>
<td>FEMALE:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Mean reading score</td>
<td>107.4</td>
<td>108.6</td>
<td>102.6</td>
</tr>
<tr>
<td>SD</td>
<td>15.66</td>
<td>14.96</td>
<td>9.74</td>
</tr>
<tr>
<td>Range</td>
<td>88-126</td>
<td>88-124</td>
<td>89-113</td>
</tr>
</tbody>
</table>

#### 6.3.2 Experience of the chosen text

The participants were asked if they had read *Journey to the Centre of the Earth* before participating in the study, as previous experience of the text was likely to affect their answers to the multiple choice comprehension questions. None of the children had read the text previously. It was thought equally important to find out if any of the user participants had seen a film adaptation of the story, which might also have affected their answers to the comprehension questions. This was particularly significant because a film version was shown on national television during the period of the study. The film was called *Journey to the Center of the Earth* (1959) and was transmitted on Channel 4. The date of transmission was such that 12 participants had already taken part in the experiment, leaving 18 trials still to be carried out. Of the 18 participants whose trials occurred after the transmission date of the film, three had seen the Channel 4 showing of the film. Of the 12 participants whose trials occurred before the transmission date, three claimed to have seen an unspecified film adaptation of the story. It is not known if any of these had seen the same film as that shown during the period of the study. It should be noted that the present author viewed the Channel 4 film, and discovered it to be substantially different from the written text, particularly with regard to the extract under examination. It was therefore considered that having viewed this particular film adaptation was unlikely either to have had beneficial or negative effects on the participants’ ability to answer the multiple choice questions. In order to confirm this assumption, the mean score achieved in the multiple choice questions by those who had seen a film adaptation...
was compared with the mean score of those who had not seen a film version. Although the mean score of those who had seen a film adaptation was higher (mean = 12.5) as compared with those who had not seen a film version (mean = 11.2), a t-test revealed that the difference was not significant.

After the participants had read the extract from the story, they were asked if they had enjoyed it and would like to read the remainder. Twenty seven (90%) of the children answered positively, while three (10%) responded negatively. One of the readers who had not enjoyed the story had experienced it electronically, and the other two had read it in the printed book version.

6.3.3 General computer experience

The participants were asked if they had use of a computer at home, as this had the potential to affect their ability to manipulate the electronic book. The possession of a home computer was relevant only to those participants in Group 2, as these were the users who read the electronic book. Of the ten participants in Group 2, seven had use of a computer at home, and three did not. When asked how often they used the computer at home, these same seven participants all claimed to use the home computer either every day or nearly every day.

It was established that all the user participants had access to computer equipment at school, and it was considered relevant to find out how regularly the opportunity to use the equipment arose. The teachers of all the classes involved in the study operated rota systems for computer use in an attempt to ensure equal access for their pupils. In all cases, this amounted to 30 to 45 minutes of computer use every two to three weeks. All ten participants who were exposed to the electronic book were proficient with the computer, and had no problems manipulating the mouse.

Of the total 30 participants involved in the study, 15 had use of a home computer, and 15 did not. When asked for what purpose(s) they used their home computer, none of the participants mentioned reading electronic
books. The main activity reported was playing games (eleven participants), with drawing (5 participants) and writing (3 participants) being the only other two applications mentioned.

### 6.3.4 General reading habits

The participants were asked various questions in order to determine their general reading habits. The children were asked if they liked reading, and 26 (87%) said they did, while one (3%) said they did not. The remaining three (10%) were indifferent. The participants were asked what sort of books they liked to read, and the top three responses were "Adventure"/"Exciting books" (9, 30%), "Horror"/"Scary books" (7, 23%) and "Factual books" (3, 10%). The remaining answers were given by two participants at the most, and were as follows: "Stories", "Anything", "Dick King-Smith", "Dinosaur books", "Humour", "Newspapers", "Picture books", and "Poems".

The participants were asked how often they read stories at home. Twenty two (73%) said they read stories at home either every day or nearly every day, and the remainder described their pattern as being once or twice a week. The children were also asked how frequently they read stories at school, and all 30 explained that it was nearly every day. Most of the participants mentioned Literacy Hour, a nationwide government initiative designed "to provide a daily period of dedicated literacy teaching time for all pupils" (Department for Education and Employment, 1998). In the case of the two schools participating in the study, this involved reading for 15-30 minutes on four days in the week.

Table 6.2 shows which book or books participants were reading at the time of the experiment. Where known, the author and first publication date of each text have been included.
## Chapter 6: Young Readers' Interactions with Electronic Books

### Table 6.2: Books being read by participants at the time of the experiment

<table>
<thead>
<tr>
<th>Title of Book</th>
<th>Author</th>
<th>1st pub.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FICTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goosebumps Series:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Stay out of the Basement</em></td>
<td>R.L. Stine</td>
<td>1992</td>
</tr>
<tr>
<td><em>The Curse of the Mummy’s Tomb</em></td>
<td>R.L. Stine</td>
<td>1994</td>
</tr>
<tr>
<td><em>Ghost Beach</em></td>
<td>R.L. Stine</td>
<td>1994</td>
</tr>
<tr>
<td><em>My Hairiest Adventure</em></td>
<td>R.L. Stine</td>
<td>1994</td>
</tr>
<tr>
<td><em>Chicken Chicken</em></td>
<td>R.L. Stine</td>
<td>1997</td>
</tr>
<tr>
<td>Title forgotten</td>
<td>R.L. Stine</td>
<td>N/A</td>
</tr>
<tr>
<td><em>Roald Dahl:</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>George’s Marvellous Medicine</em></td>
<td>Roald Dahl</td>
<td>1981</td>
</tr>
<tr>
<td><em>Roald Dahl Treasury</em></td>
<td>Roald Dahl</td>
<td>1997</td>
</tr>
<tr>
<td><em>Keith Brumpton:</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Forecast of Fear</em></td>
<td>Keith Brumpton</td>
<td>1993</td>
</tr>
<tr>
<td><em>The Mystery of the Missing Moggie</em></td>
<td>Keith Brumpton</td>
<td>1993</td>
</tr>
<tr>
<td><strong>General:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>The Railway Cat</em></td>
<td>Phyllis Arkle</td>
<td>1985</td>
</tr>
<tr>
<td><em>The 39 Steps</em></td>
<td>John Buchan</td>
<td>1915</td>
</tr>
<tr>
<td><em>Through the Looking Glass</em></td>
<td>Lewis Carroll</td>
<td>1871</td>
</tr>
<tr>
<td><em>Moonial</em></td>
<td>Helen Cresswell</td>
<td>1987</td>
</tr>
<tr>
<td><em>Asterix the Gladiator</em></td>
<td>R. De Goscinny &amp; M. Uderzo</td>
<td>1969</td>
</tr>
<tr>
<td><em>Stone Croc</em></td>
<td>Penelope Farmer</td>
<td>1991</td>
</tr>
<tr>
<td><em>The Secret Garden</em></td>
<td>Frances Hodgson Burnett</td>
<td>1911</td>
</tr>
<tr>
<td><em>The Time-Travelling Cat</em></td>
<td>Julia Jarman</td>
<td>1993</td>
</tr>
<tr>
<td><em>Hairy &amp; Slug</em></td>
<td>Margaret Joy</td>
<td>1985</td>
</tr>
<tr>
<td><em>Connie &amp; Rollo</em></td>
<td>Dick King-Smith</td>
<td>1994</td>
</tr>
<tr>
<td><em>The Worst Witch</em></td>
<td>Jill Murphy</td>
<td>1974</td>
</tr>
<tr>
<td><em>The Hobbit</em></td>
<td>J.R.R. Tolkein</td>
<td>1937</td>
</tr>
<tr>
<td><em>Howard Helps Out</em></td>
<td>Colin West</td>
<td>1994</td>
</tr>
<tr>
<td><strong>FACTUAL:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Book about games</em></td>
<td>Not known</td>
<td>N/A</td>
</tr>
<tr>
<td><em>Using Energy</em></td>
<td>Not known</td>
<td>N/A</td>
</tr>
<tr>
<td><em>Crystals</em></td>
<td>Not known</td>
<td>N/A</td>
</tr>
<tr>
<td><em>Planes</em></td>
<td>Not known</td>
<td>N/A</td>
</tr>
<tr>
<td><em>Sport book</em></td>
<td>Not known</td>
<td>N/A</td>
</tr>
<tr>
<td><em>Book about “The Titanic”</em></td>
<td>Not known</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>AMBIGUOUS:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forgotten name</td>
<td>Not known</td>
<td>N/A</td>
</tr>
<tr>
<td>Not much at the moment</td>
<td>Not known</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*These texts were each being read by two different participants*

Table 6.2 shows that more of the children were reading fiction than were reading factual books, which suggests a general preference for the former within the user sample. The relatively high proportion—six out of the 33 books being read—from the *Goosebumps* series reflects the current popularity of these horror fiction stories, which are aimed at the under-12s
All participants were asked if they liked reading *Goosebumps* stories, and 20 (67%) of the participants said that they did, while the remainder stated that they did not. The series and its prevalence will be discussed further in Chapter 5 of this thesis.

Participants were also asked if they enjoyed reading books by Roald Dahl. The question was included both because of the prevalence of Dahl's work with the age group under consideration, and as a means of comparison with the author popularity study discussed in Chapter 5. Twenty six (87%) of the participants said that they did enjoy Dahl's work, and the general popularity of his books can also be seen in Table 6.2, where three of the participants claimed to be reading one of Dahl's texts at the time of the experiment.

Since the text being employed in the study could be considered to be a "classic", it is interesting to note the scarcity of such texts in Table 6.2. The only text which can be described as classic is *Through the Looking Glass*, although it could be argued that *George's Marvellous Medicine*, *The Hobbit*, and *The Secret Garden* are modern classics for children. The subject of classic texts and their presentation in the electronic medium will be discussed in Chapter 4 of the thesis.

The influence of television on children's reading was demonstrated by the two participants who were reading *The Worst Witch* by Jill Murphy. A series of programmes adapted from the story had recently been transmitted on Independent Television (ITV) at the time of the experiment, and both participants confirmed that they were reading the book as a direct result of viewing these programmes.

As a result of the general decline in the use of public libraries by children, a question was asked about borrowing books from the local library. Twenty two (73%) of the user participants said that they did regularly borrow books from the local library, while eight (27%) said they did not. It is recognised that a relatively small sample is being studied here, however, the question showed that a fairly high number of participants do make use of their public library. Chapter 7 of this thesis comprises a detailed consideration of public library attitudes to electronic books.
As a test of the form in which the participants preferred stories, they were asked which they read most often and which least often of the following three media: story books, comics and stories on tape. As can be seen from Table 6.3, story books were the most preferred of the three media, with 22 (73%) of the participants reading them most often, and no users citing them as the medium read least often. Comics were the most popular with only six participants, and stories on tape with just two. Comics and audio offer some of the added features incorporated into electronic books, so this could be seen as an indication that the participants preferred stories in printed book form. However, it is recognised that the children might have considered comics and stories on tape to be somehow less serious than story books and so claimed to read them less often.

<table>
<thead>
<tr>
<th>MEDIUM</th>
<th>MOST OFTEN</th>
<th>NEITHER MOST OFTEN NOR LEAST OFTEN</th>
<th>LEAST OFTEN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Story books</td>
<td>22</td>
<td>73</td>
<td>8</td>
</tr>
<tr>
<td>Comics</td>
<td>6</td>
<td>20</td>
<td>6</td>
</tr>
<tr>
<td>Stories on tape</td>
<td>2</td>
<td>7</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 6.3: Participants' use of different media for stories

6.3.5 Experience of electronic books

In an attempt to discover how much of a novelty electronic books might present to participants, they were asked if they had ever “seen or read a book on a computer”. Twenty three (77%) of the children claimed to have had no experience of electronic books, while seven (23%) affirmed that they did have experience of them. It is useful to note that, of the seven participants with experience of electronic books, four were included in the group which was exposed to the electronic version of the text. Details (where known) of the electronic books which had been seen or read are shown in Table 6.4.
Table 6.4: Electronic books which participants had seen or read
*Suchowski, 1998

<table>
<thead>
<tr>
<th>Title</th>
<th>Details*</th>
<th>Publisher</th>
<th>1st release</th>
</tr>
</thead>
</table>
| 101 Dalmatians Animated Storybook | Multimedia content: audio, images  
Audience: pre-school, elementary, entertainment  
Subject: Children's Literature, Entertainment, Education and Training | LucasArts            | Not known   |
| Busytown (Richard Scarry) | Multimedia content: audio, images  
Audience: pre-school, elementary, secondary  
Subject: Education and Training, Entertainment | Paramount Digital Entertainer | 1993 |
| The Lion King Animated Storybook | Multimedia content: audio, images  
Audience: pre-school, elementary, entertainment  
Subject: Children's Literature, Entertainment, Education and Training | Disney Interactive | 1994 |
| Arnold                   | Story book. No further details obtainable       | Not known            | Not known   |
| Explorers                | Factual book. No further details obtainable     | Not known            | Not known   |
| Not known                | Two participants could not provide any details  | N/A                  | N/A         |

As shown by Table 6.4, four participants had read electronic story books, and one had read a factual electronic book. The remaining two participants could not remember any details of the electronic book they had seen. Reading electronic books was by no means a frequent activity for the participants, since all seven of them maintained that they had only ever done so once.

6.3.6 Multiple choice questions

The mean scores for the two different question orders were similar: for those experiencing the questions in story order, the mean score was 11.9, and for those experiencing the questions in random order, it was 11.0. A t-test revealed that the difference was not significant. Consequently, it is appropriate to conduct further statistical analysis based on all thirty participants.
Chapter 6: Young Readers' Interactions with Electronic Books

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print Out from Electronic Book</td>
<td>11.7</td>
<td>4.08</td>
</tr>
<tr>
<td>Electronic Book</td>
<td>12.6</td>
<td>3.63</td>
</tr>
<tr>
<td>Printed book</td>
<td>10.1</td>
<td>2.64</td>
</tr>
</tbody>
</table>

Table 6.5: Multiple choice score mean and standard deviation

The mean score and standard deviation for the number of correct answers gained by the participants experiencing each condition are shown in Table 6.5. Although there was a trend for those reading the electronic book to score higher on the multiple choice questions, an analysis of variance (ANOVA) test revealed that the differences between conditions were not significant.

A post hoc t-test was carried out comparing the multiple choice score gained by Group 2 (electronic book) and Group 3 (printed book version), as the two most disparate conditions of the study. There was a trend for participants in Group 2 to score more than participants in Group 3, however, the difference was not significant (p = 0.09).

To investigate the relationship between participants' scores for the multiple choice questions and their reading score, a Pearson correlation coefficient was calculated. Since a positive correlation was anticipated, a 1-tailed test was applied. A positive correlation was found, such that $r = 0.323; p < 0.01$. This correlation can be seen in Figure 6.1.
The number of correct and incorrect replies received in answer to each of the 20 multiple choice questions are shown in Figure 6.2. In cases where a participant failed to answer a question, it was counted as being wrong. The chronological order of questions has been employed as the basis. The two question orders are shown in Appendix 6.5, and only the number of the question as it appeared in the story order list will be quoted in the following discussion.
As can be seen from Figure 6.2, there were certain multiple choice questions which proved to be either particularly easy or difficult to answer. Appendix 6.4 comprises the complete set of multiple choice questions. The question which proved most difficult to answer was number 3, "How did Axel feel when he saw the inland sea?" Twenty nine user participants got this question wrong, which means that only one person (who was in the electronic book group) was right. The answer was "sad", and was found in the sentence, "But for me the effect was sad and melancholy". It is difficult to be sure why this question was so difficult, but one possible reason is that the participants were more interested in the action of the story, and failed to pick up on the feelings described in it. Table 6.6 shows the responses given to this question by all 30 respondents, and it is interesting to note that most of the participants thought the answer was “happy”, which is the opposite concept to that expressed by the correct response.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Happy</td>
<td>16</td>
</tr>
<tr>
<td>B.</td>
<td>Angry</td>
<td>2</td>
</tr>
<tr>
<td>C.</td>
<td>Sad</td>
<td>1</td>
</tr>
<tr>
<td>D.</td>
<td>Frightened</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>No response</td>
<td>6</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

Table 6.6: Responses to Question 3 (15)
Another question which was difficult to answer was number 5. The question asked, "The thigh-bone of which prehistoric animal was found by Axel, Hans and the Professor in the forest near the inland sea?" The correct answer was "a megatherium". Table 6.7 shows that no single incorrect option dominated the responses to this question, including "a dinotherium", which is a similar word to the correct one, and which appeared in the same sentence. This suggests that the majority of the participants found this question of equal difficulty.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>A megatherium</td>
<td>9</td>
</tr>
<tr>
<td>B.</td>
<td>A woolly mammoth</td>
<td>3</td>
</tr>
<tr>
<td>C.</td>
<td>A dinotherium</td>
<td>3</td>
</tr>
<tr>
<td>D.</td>
<td>A brontosaurus</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>No response</td>
<td>7</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

Table 6.7: Responses to Question 5 (19)

Question 15 also presented some problems to the participants. The question asked "What sort of trees from the immense forest were described as being without colour because they were getting no sunlight at the centre of the Earth?" The correct answer was "conifer trees". Table 6.8 shows that, once more, no single incorrect option dominated the responses to this question, suggesting again that the majority of participants found this question of equal difficulty.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Oak trees</td>
<td>5</td>
</tr>
<tr>
<td>B.</td>
<td>Conifer trees</td>
<td>10</td>
</tr>
<tr>
<td>C.</td>
<td>Silver birch trees</td>
<td>5</td>
</tr>
<tr>
<td>D.</td>
<td>Willow trees</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>No response</td>
<td>8</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

Table 6.8: Responses to Question 15 (10)

The six questions which proved the easiest to answer were numbers 19, 9, 20, 18, 17, and 14. The ratio of wrong and right answers to these questions is shown by Figure 6.2. When deliberating why these questions were particularly easy to answer, it seems necessary to consider if the illustration on the appropriate page might have provided the solution. An illustration in conjunction with the text might make a certain section of the story more memorable, or might mean that it would not be necessary to read the text thoroughly in order to know the answer to the question. This would show an advantage to those reading the print out from the
electronic book or the electronic book itself, since these two media included such illustrations. The presence of illustrations was appropriate in the case of questions 19, 17 and 14. With regard to questions 19 and 14, there was an even distribution of incorrect answers between the groups, suggesting that the question was of equal difficulty for all participants and that the illustrations did not offer a particular advantage. In the case of question 17, there was a less even distribution of incorrect answers (1 in Group 1, 3 each in Groups 2 and 3), which does not suggest a particular advantage with the presence of illustrations, since the electronic book and the printed book group had the same number of incorrect answers.

A further reason for the group reading the electronic book to find particular questions simple might be that the computer animation within the book provided the answer. There are various ways in which an animated illustration could make particular parts of the story more memorable. Firstly, if the story is made more interesting by animation, it will engage the reader's attention more and therefore be better remembered. Secondly, the animation might supplement comprehension and render the story less ambiguous, which will also make it more memorable. Lastly, the animation may make concrete temporal and sequential incidents in the story which might supplement comprehension and render the story clearer, thus making it more memorable (Lansdale, 1999). Animated illustrations could also mean that it would not be necessary to read the text thoroughly in order to know the answer to the question. Such animated illustrations were appropriate in the case of questions 20 and 18. In the case of both questions, however, the numbers of participants from each group getting the answer wrong are too small to draw any firm conclusions on this issue.

A third reason for questions proving comparatively easy might be that the incorrect multiple choice options were too unlikely, which would have the effect of making guessing easier. A good example of this can be seen in question 19, "What blocked the way in the tunnel?". The answer was "a large block of granite", and the incorrect options were as follows: "an elephant", "a huge locked door" and "a brick wall".

Another possible explanation might be that the easily answered questions came from particularly memorable sections of the story, for example,
question 17. The question asked “What sort of knife did Axel find on the rocks near where the raft was wrecked?”, the answer being “a rusty knife”. The knife is discussed at greater length further on in the text, which could have helped the readers to remember more about it, therefore simplifying this question.

It is recognised that the participants from each school, particularly those in the same class, might have talked about the experiment to each other. Such discussions might have led to some participants being forewarned about the comprehension questions, and therefore have meant that those taking part in the later stages of the trials scored higher on the questions. The scores for each participant are plotted in chronological order (including by time of day) in Figure 6.3, and no particular effect can be observed.

![Figure 6.3: Multiple choice score in chronological order](image)

**6.3.7 Reading speed**

ANOVA tests were carried out on the time taken to read the summary of the “story so far”, the time taken to read the text itself, and the time taken to complete the 20 multiple choice questions. No significant differences between conditions were found by any of the tests.
Chapter 6: Young Readers' Interactions with Electronic Books

A basic reading speed was calculated for each participant using the time taken to read the summary. The number of seconds taken to read the summary was divided by the number of words making up the summary (399) to give an average number of words per second. This figure was then multiplied by 60 to give an average number of words per minute. In order to compare the basic reading speed with the speed at which participants had read the story text, a similar calculation was done for the time taken to read the text. That is, the number of seconds taken to read the text was divided by the number of words making up the text, remembering that there were slightly more words in the printed book (2716) than in the other two versions (2686 in each case). This was because the printed book included a title page and chapter numbers and titles. Once the average number of words per second had been calculated, this was once more multiplied by 60 to give an average number of words per minute with regard to reading the text. An overall average number of words per minute was then calculated for each group, both for time taken to read the summary and time taken to read the text. These averages are shown in Figure 6.4.

Figure 6.4 Average number of words per minute taken to read summary and text

The above graph shows that the average time taken to read the summary and the average time taken to read the text were similar for Group 1 (print out from electronic book condition) and Group 3 (printed book condition).
However, in the case of Group 2 (electronic book condition), the average speed at which subjects read the summary was somewhat faster than that for the text. A t-test revealed that the difference was significant (p <0.05).

With regard to the time taken to read the text extract, it is valuable to note that the narration of the electronic book takes a total of 16 minutes and 14 seconds. This timing assumes that each page is read through once in its entirety, and that the next page is accessed directly after the previous one has finished. The mean time taken to read the text for all three conditions was 19 minutes and 22 seconds, and the mean time taken to read the text in electronic form was 19 minutes and 46 seconds.

### 6.3.8 Gender

The mean score achieved in the multiple choice questions by the female participants was compared with the mean score of the male participants. The mean score of the males was higher (mean = 12.1; SD = 3.48) compared to that of the females (mean = 10.8; SD = 3.59), but a t-test revealed that the difference was not significant (p = 0.31).

The mean score achieved in the multiple choice questions by the female participants was then compared with that of the male participants within each of the three conditions separately. In each case, a t-test revealed that the difference was not significant. As can be seen from Table 6.9, the trend for gender differences within the print out condition was similar to that for the three conditions together, with the mean score for males being slightly higher than for females. Within the electronic book condition, however, the mean scores for the two genders are almost the same, with the females this time having a very slightly higher result. In the case of the printed book group, the mean score for the female readers is rather lower than that for the females across the three conditions. Therefore, it can be seen that the general trend for multiple choice score split by gender for the three conditions together is not reflected in the scores within each condition separately.
6.3.9 Observation

All of the user participants were observed unobtrusively while reading the extract from *Journey to the Centre of the Earth*. There was little to note in the case of those reading the print-based media (Groups 1 and 3), since they were simply reading quietly to themselves. However, the additional features incorporated into the electronic book presented several factors which could be observed while the children were reading it.

Five of the participants in Group 2 listened to the computer narration throughout the whole of the text extract, while the remaining five did not. The two reasons for not listening were: a) the pace of the computer narration was too slow and the participants did not want their reading directed in this way, and b) that they were more interested in finding the interactive hot spots.

Five of the participants in Group 2 looked for and found the hot spots from the first page of the electronic book. Two of the children had difficulty finding the computer animation, but after they were successful on the third or fourth page of the extract being read, became more adept at finding them. These seven participants were amused by the animation they found, and were very keen to find out which parts of the illustrations would respond. The eighth child was impatient with the animated features, that is, if two to three clicks on the illustration did not yield a result, they went on to the next page. The last two readers of the ten in the group did not look for the hot spots, and on subsequent questioning, claimed they were not at all interested in finding them. The effect that these activities might have had on the time taken to read the text is discussed later.

It is also worth noting that two of the participants, both male, appeared very unenthusiastic about reading the electronic book. One kept his arms crossed and sat back in his chair while reading, and the other kept speaking...
to the experimenter and asking how close it was to lunch time. However, a similar lack of enthusiasm was noticed with a further four participants, two from Group 1 (one male and one female) and two from Group 3 (again one male and one female). It therefore seems that this lack of enthusiasm for the text was neither confined to the electronic version nor to the male participants. With regard to the issue of navigation within the electronic book, only one child experienced any difficulty, getting lost on the penultimate page. The participant found her way back to the map (contents) screen, but required the experimenter to locate the appropriate page to continue reading. Although this process took only approximately thirty seconds, it is recognised that this would have had an effect on the time taken by this subject to read the electronic book.

6.4 Discussion

The results indicate that Journey to the Centre of the Earth was a suitable choice of text for the study, since none of the participants had previously read it, only six had seen a film version, and the majority claimed to have liked the text. It was also found that Roald Dahl is a very popular author among the children taking part in the study. The great majority of participants claimed to enjoy Dahl's work, and three of them were reading one of his books at the time of the experiment. This finding offers genuine evidence to support the assumption of the great popularity of Dahl which is at the centre of Chapter 5.

It was clear from the study results that the reading of electronic books of any type was not widespread amongst those taking part. Various other findings of this study indicate that the participants were not experiencing particular problems with access to computers at school and at home. It could therefore be that the participants had a limited awareness of electronic books which was preventing them from reading them. As has been discovered by research which will be discussed later in the thesis, young readers are not likely to come across electronic books in smaller bookshops, where they could be buying printed books. However, other research which will also be discussed later in the thesis indicated that electronic books are more likely to be found in libraries, so those children who are regular library borrowers could have experience of electronic texts
in such a location. The apparent lack of reading of electronic books amongst the participants could also have been due to them having an insufficient understanding of what is meant by an electronic book, which meant that they had actually read more of them than they realised. The relatively high cost of electronic books compared to that of printed books might also have prevented the children from exposure to electronic texts.

A positive correlation was found between participants' scores for the multiple choice questions and their reading score. It was expected that those with a higher reading score were likely to have better general comprehension skills than those with a lower reading score. The positive correlation confirms this expectation.

There is a generally held view that girls experience limited access to electronic media and are therefore disadvantaged by a lack of the skills required to make use of them (e.g. Spender, 1996; Livingstone and Bovill, 1999). This was not reflected by the study, since although there was a trend for male participants from all three conditions to score higher on the multiple choice questions, the difference was not significant. More importantly, within the electronic book condition alone the mean scores for the two genders were almost the same. This finding suggests that the female participants did not encounter any particular difficulties with reading the electronic text, and that their comprehension of the story was not affected by reading it in the electronic format. It is worthy of note that a recent study of children and the new media (Livingstone and Bovill, 1999) found that young girls and boys have an equal liking for computers, but that "... after about 10-11 girls turn away and their attitude becomes ... less confident." (Ch. 2 Pg. 16) Since the female participants in this study were aged between nine years and one month and ten years and nine months, according to Livingstone and Bovill's finding, they were at the age just before their enthusiasm for computers will begin to decline. It is therefore likely that the female participants in the present study had a roughly equal level of enthusiasm for computers as did the male participants. It could be argued that this finding indicates that the gender of the participants was not as consequential an issue in comprehending the story as was their reading score.
With regard to the scores for the multiple choice questions, it was found that the differences between conditions were not significant. There is, therefore, certainly no evidence to suggest that the added effects and visual dimension offered by the electronic book reduced participants' comprehension of the text. Indeed, there was a trend for those reading the electronic book to score higher on the multiple choice questions than those reading the other two versions of the text. As a result, a further test was carried out comparing the multiple choice scores of the two most disparate conditions of the study, that is, the electronic book and the printed book. Once more, there was a trend for those reading the electronic book to score higher, however, the difference was similarly not significant. These trends, although not significant, show that electronic books might actually aid the reader's comprehension of a text rather than hinder it. The added effects which could be considered to be a distraction might therefore actually be beneficial to readers in their comprehension of electronic books. As discussed above, an animated illustration in conjunction with the text could make particular parts of the story more memorable. An animated illustration could also mean that it would not be necessary to read the text thoroughly in order to know the answer to a multiple choice question about it. It is possible that this might have helped participants in Group 2 to answer the multiple choice questions correctly.

No significant differences were found between conditions when testing the time taken to read the text. This finding could be seen as implying that experiencing the added features of the electronic book was not causing the participants to spend more time reading it. However, as noted above, when each page is read through once completely, and the next page is accessed straightaway, the narration of the electronic book takes a total of 16 minutes and 14 seconds. Since the mean time taken by the participants to read the text in the electronic format was 19 minutes and 46 seconds, it can be argued that they were generally not simply listening to the computer narration when reading the book, and the difference in the time taken to read the story was due to the fact that participants were exploring the added features included within the electronic text. The difference in time taken to read the story could also be due to the fact that participants found that the computer narration was too fast for them, and were simultaneously reading the text to themselves at a slower pace. However, none of the readers said they had stopped the narration because it was too
fast (of the five participants who did stop the narration, three disabled it because it was too slow and two disabled it because they wanted to find the interactive hot spots), which tends to contradict this possibility. This ambiguity about the timing of the computer narration may demonstrate a requirement for electronic books to be adaptable and to allow readers to vary the speed at which stories are narrated.

Furthermore, a significant difference was found within the electronic book condition between the average time taken to read the summary and the average time taken to read the text. The fact that, on average, the participants read the summary faster than they read the text suggests that either the electronic book read slower than their natural reading speed and they did not stop the narration, or that they read the book at their own speed and the additional time was being used to experiment with the added extras of the electronic book. The difference could have been due to an anticipatory effect, that is, the participants in the electronic book group had experienced a demonstration of an electronic version of Peter Pan similar to the chosen text. After this demonstration, participants were told they would soon be reading the other electronic book, Journey to the Centre of the Earth, which could have resulted in them hurrying through the reading of the summary in order to get back onto the computer.

6.4.1 Methodology issues

It is thought to be important to note that this study had the potential for an "experimenter effect". The first instance where this was possible was when participants were asked if they had enjoyed reading the extract from Journey to the Centre of the Earth. They might not have enjoyed reading the text, but have said they did in order to please the experimenter. There was some evidence of this in the case of the participant who checked regularly to see how many pages of the text remained, and so seemed eager to finish reading, but who then claimed to have enjoyed the story. The second instance where an experimenter effect was possible was with regard to participants’ responses when asked if they liked reading. The high proportion of participants answering positively was encouraging, however, the children might have seen the experimenter as being on a similar level to a teacher, and so thought that their response ought to be positive. In order to avoid participants considering the experimenter as
being similar to a teacher, they were introduced to the experimenter by first name.

It is a possibility that, since the participants had so little experience of reading electronic books, there was a novelty factor when reading that version of the text. Such a novelty factor could have contributed to the trend for those reading the electronic book to score higher on the multiple choice questions than those reading the other two versions of the text.

6.5 Conclusions

The following conclusions can be drawn from the study:

- There was no evidence to suggest that the added effects and visual dimension offered by the electronic book reduced participants' comprehension of the text. Indeed, there was an indication that this particular type of electronic book might actually aid the reader's comprehension of a text rather than hinder it
- The participants' reading score had a greater effect on their comprehension of the story than either their gender or the medium on which the text was presented
- The female participants were not disadvantaged with regard to the electronic text
- Although no significant differences were found between conditions when testing the time taken to read the text and the time taken to read the summary, there was some evidence that participants in the electronic book condition read the text more slowly than they read the summary
- It is considered that future work could observe how electronic books are used practically in a real setting. The study entailed some methodological issues which any future work based on this study should attempt to address

If children do indeed choose to read electronic books, an important question to ask is: where will they get them from? A consideration of the principal suppliers of books and whether and how they are embracing electronic books will be discussed in the following Chapter.
Chapter 7: The Current and Future Role of Electronic Books within UK Book Suppliers

"Even the most misfitting child
Who's chanced upon the library's worth
Sits with the genius of the Earth
And turns the key to the whole world"

(Hughes, 1997)

7.1 Introduction

If children are to be able to read books of any kind, they must obtain them from somewhere. Presently books are either borrowed from libraries (particularly public libraries) or bought from book shops. Although there are indications that issues from public libraries are decreasing (Creaser et al., 2000), an increasing number of books are being bought, in terms of volume as well as value (Book Facts, 1999). Indeed, a link has been found between the borrowing and buying of books – a study by Book Marketing Ltd (Book Facts, 1999) has found that those buying the most books are also more regular book borrowers. As the two principal suppliers of books, public libraries and book shops are likely to be affected in various ways by the emergence of the electronic book. Two studies investigating the current and future role of electronic books within these book suppliers were therefore carried out.

7.1.1 Libraries

There can be little doubt of the importance of the library in encouraging people of all ages to read. In the case of children, libraries play an especially important part in helping them to develop reading skills and literacy (Lonsdale, 2000). It has therefore been of particular concern that children are widely believed to be drifting away from books and libraries (Livingstone and Bovill, 1999; Creaser, 1999). Evidence suggests that the number of issues of books to children in public libraries is declining, but that audio visual issues including CD-ROM are rising (Creaser, 1999). As a result, increasing importance is being placed on extending the definition of
literacy to include the reading of electronic formats (Meek, 1991), and a recent study of the relationship between children's reading and public libraries found that as many as 80% of library authorities consider non-book literacy to be significant (Lonsdale, 2000). The electronic book is therefore of significant relevance to public libraries.

In addition, the view that the electronic book will largely replace its printed counterpart (e.g. Max, 1994) has naturally led to the suggestion that the result could be the extinction of the library, or at least its radical alteration (Barker, 1997; Landoni et al, 1993; Yankelovich, 1991). Indeed, changes to the "traditional library" (Landoni et al., 1993) are already being made, with library automation becoming increasingly more widespread. Described by Barker (1997) as the "polymedia library", these are "institutions that store information and knowledge using a wide variety of media types." (p 145). These libraries are very similar to present library systems, containing printed books together with information that is held on various media including video, audiotape, CD-ROM, etc. The logical step on from such polymedia libraries would be the digital or electronic library, a concept which has been studied and discussed in considerable detail elsewhere (for example, Catenazzi et al., 1993; Feather and Sturges, 1997). The digital library would allow the universal accessibility of information, a possibility which is becoming increasingly feasible as the influence and spread of the Internet become greater, and an escalating amount of information becomes available online. This is particularly relevant to libraries with the introduction of the People's Network (People's Network Online, 1999) and the National Grid for Learning (Heeks, 2000; National Grid for Learning, 2000. See also Chapter 8).

However, the more widely accepted view that the electronic book and the traditional printed book will exist alongside one another rather than the former completely replacing the latter (e.g. Eco, 1995; Goodman, 1993) would mean the continuation of the hybrid or polymedia library, which is the current norm. Whether the fully digital library or the hybrid library is the model, libraries will be affected by the inclusion of electronic books.

The potential impact of the introduction of electronic books into libraries is, therefore, a subject worthy of investigation. As a result, a study was planned into the extent of electronic books already in libraries, and the effects they are having on those libraries and their staff. A literature
review established that it was fairly widely accepted that electronic books will play a very important role in digital libraries (e.g. Catenazzi and Sommaruga, 1995; Landoni et al., 1993), but there was very little work on the subject of how traditional libraries are dealing with them at present. The literature which was found mainly concerned speculation on possible roles for libraries as electronic books enter the library alongside traditional printed books (e.g. Woodward, 1995; Goodman, 1993). However, a gap in the literature was observed with regard to the role and opinions of library staff on the subject of electronic books.

Since the principal emphasis of this thesis is on younger readers and their tendency to move away from reading and consequently from libraries, it was appropriate that the study should focus on library services for children. Despite the general trend for children to move away from libraries, many younger readers still find the library important for help with their homework (Children's Literature Research Centre, 1996; Creaser, 1999). Furthermore, although book issues are declining, a survey of children's current reading habits (Children's Literature Research Centre, 1996) found that libraries are still a significant source for borrowing books. For those children who did borrow books, the local library was the second most frequently cited regular source for children up to the age of 14 years (after borrowing from school), and was the most frequently cited regular source for children of 14 to 16 years. Furthermore, and as discussed above, issues of non-book material including CD-ROM are rising. Indeed, a study by Brunskill et al. (1998) found that electronic material can bring people, particularly children, into the library. The most appropriate participant population for a study of electronic books for children within libraries was identified as being those members of staff responsible for children's services within the public libraries of the United Kingdom.

7.1.2 Book shops

It has been claimed that electronic books are becoming increasingly more of a presence in book shops (Lambie, 1994), and the fear that they might supersede printed books (Cox, 1997; Walsh, 1996; Max, 1994) is likely to be of particular concern, as this will necessarily affect their business (Langstaff, 1993; Lambie, 1994), forcing them to change the goods they sell. Furthermore, the Internet could represent a threat to the need for book
shops as information in general becomes more and more easily available online (Borrell, 1992). With the increasing number of texts becoming directly available via the Internet, and the opportunities being offered to both writers and publishers to sell directly to the customer (McGuire, 1997; Farrington, 1994), there are greater chances that the bookseller might be excluded from the process completely. Larger book chains such as Waterstone's have been able to provide their own "Internet bookstores" (Glaister, 1997), however, these facilities are unlikely to be relevant to the needs of the majority of smaller book shops. Nevertheless, the importance of the physical act of browsing and the delight of handling printed books cannot be ignored as significant benefits offered by book shops (Church, 1995; Langstaff, 1993; Borrell, 1992).

Electronic books presented on CD-ROM or as floppy disks perhaps pose less of a threat to book shops than those on the Internet, since as far as the bookseller is concerned, they are much like printed books in many respects. There are some difficulties which might be encountered through selling electronic books, such as the provision of equipment for demonstrating the products, the need to supply technical support, and the wider range of competitors (Lambie, 1994); finding space for display within the shop (Langstaff, 1993), and the requirement for greater security. These difficulties might not pose too much of a problem for larger book shops, such as W H Smith, who are already stocking electronic books. However, smaller book shops, many of whom have not yet entered the field of selling electronic products, could encounter problems.

Within the literature there is a lack of information about the role and opinions of book shop owners and staff on the subject of electronic books, so it was decided that a study focusing on those individuals would be beneficial. Moreover, it was decided that the study should concentrate on smaller book shops rather than large chains, because of the fact that many smaller book shops had not yet begun selling electronic books. It was also believed that representatives of smaller book shops would be able to offer more varied opinions and be easier to contact, since decisions about the stocking of electronic books are likely to be taken at a level higher than individual branches within larger retailers. It was considered of interest to the study that, although they are a major supplier of reading matter, smaller book shops are likely to encounter various difficulties when
selling electronic books. They are, however, unlikely to find it necessary to use the Internet for selling and marketing, unless they provide services to a niche market (Farrington, 1994). The aim of the study was therefore to find out more about the opinions of owners and staff of smaller book shops on the subject of electronic books.

7.2 Method

Postal surveys were carried out, since the intended populations were both widely dispersed, and therefore difficult to reach in any other way. It was thought that the proposed participant populations for the surveys would be interested in the subject of the survey, and would be keen to voice their opinions on it. As a result, it was considered that a fairly high response rate was likely to be achieved. A questionnaire was designed as a means of gathering structured information, and in order to gauge current views on the subject of electronic books.

7.2.1 Questionnaire design

Librarian Study
Pertinent topics for inclusion in the questionnaire were determined initially through an investigation of the relevant literature and a consideration of the concerns thought to be of consequence. These issues were subsequently discussed with all the children's librarians from the Leicestershire area at one of their regular meetings. A list of questions was circulated a week before the meeting in order to ensure the librarians had time to think about the subject beforehand, and to help direct the discussion. The librarians assisted in identifying which were the most significant issues, and those which were ultimately included in the questionnaire are as follows:

- definitions of the electronic book
- the present position on the stocking of electronic books
- whether electronic books are stocked for reference or for loan
- the popularity of multimedia products
- charging policies
- the effect on membership
Chapter 7: The Current and Future Role of Electronic Books within UK Book Suppliers

- the selection of electronic products
- security issues
- the additional measures necessary when stocking electronic books
- displaying electronic books
- the role of the librarian
- general views on the viability, value, etc. of electronic books

Bookseller study

The pertinent issues for inclusion in the questionnaire were determined through an investigation of the relevant literature and a consideration of other concerns thought to be important. The questions which were ultimately included covered the following subjects:

- the meaning of the term "electronic book"
- the present position regarding stocking electronic books
- the types of electronic books currently being sold
- the demonstration and display of electronic books
- security issues
- business concerns, including charging of VAT, competitors, and price
- general views about electronic books

Both questionnaires were designed in an iterative manner, with the various drafts being produced with help of criticism from colleagues. This was necessary in order to ensure that the questionnaires contained no inconsistencies, were easy to understand and complete, and addressed the relevant issues. An assurance was given to all potential respondents that any answers received would be treated in strict confidence. Where appropriate, the questions were kept the same between the two questionnaires, in order to make possible direct comparisons between the two.

7.2.2 Pilot studies

As part of the iterative process, a pilot study was carried out for both studies. These were arranged in order to confirm that both questionnaires were easy to understand and complete and included no inconsistencies or discrepancies.
Chapter 7: The Current and Future Role of Electronic Books within UK Book Suppliers

Librarian Study
The questionnaire was sent to five of the potential respondents from the participant list, concentrating on local authorities in reasonably close proximity to Loughborough. The pilot participants represented Leicestershire, Nottinghamshire, Warwickshire, Northamptonshire and Derbyshire and were telephoned beforehand to obtain their agreement to take part. Changes were made according to comments made by the five pilot participants, which included alterations to the titles referring to those who might be primarily responsible for selection of electronic books, additions to the criteria for selection, and minor changes to the wording of some of the attitude statements. One pilot respondent thought that many authorities were likely to make use of a commercial organisation called Ramesis (Ramesis, 1998), which provides electronic books for loan. A question on this issue was therefore added to the questionnaire. No other, more major changes were made to the questionnaire, because the pilot participants found it straightforward and quick and easy to complete. A copy of the final questionnaire is included as Appendix 7.1.

Bookseller Study
Two local book shops were approached for their views on the questionnaire. In common with the intended sample for the main study, both shops were members of the Booksellers Association, and were identified as such through the Directory of Booksellers Association Members 1995/1996. The Managers of both shops expressed their approval of the questionnaire in its latest draft, and claimed to have experienced no difficulties in understanding it. Neither Manager could see any problem for respondents filling in the questionnaire, and it was therefore considered to be ready for the main study. A copy of the final questionnaire is included here as Appendix 7.2.

7.2.3 Questionnaire studies

Librarian Study
The final questionnaire, together with a covering letter (Appendix 7.3) and a reply paid envelope, was sent out by post to each of the 208 local government authorities in the UK. It would not have been feasible to send the questionnaire to each library in the UK, as there were more than four
Chapter 7: The Current and Future Role of Electronic Books within UK Book Suppliers

thousand (LISU, 1998). Consequently, to ensure the widest possible coverage of public libraries throughout the country, the questionnaire was sent out to the person responsible for public library services for children at each of the 208 local government authorities in the UK. Given the concentration on children's services, it was decided that public libraries would be more appropriate than academic libraries. A list of names and addresses for the relevant contacts was supplied by the Library and Information Statistics Unit (LISU). However, due to the reorganisation (1st April 1998) of local government, which involved some authorities being completely disbanded and others having areas becoming unitary authorities, some names and addresses were not immediately available. It was therefore necessary to telephone the relevant new authorities to find out the missing information.

A last return date approximately three weeks after the date of posting was stipulated, by which time 126 usable replies were received, representing a return rate of 61%. In order to improve on the rate of return for this survey, a follow up letter and another copy of the questionnaire were sent out to those from whom no reply had been received (see Appendix 7.4). This yielded a further 35 completed questionnaires, making a final total of 161 usable replies and improving the rate of return to 77%.

Bookseller Study
The questionnaire was sent out by post to 252 book shops in Great Britain and Ireland, these being identified through the Directory of Booksellers Association Members 1995/1996. Those establishments within the Directory with more than 2 branches were deemed to be part of a chain, therefore not qualifying as smaller book shops, and were discounted. In addition, it was thought that shops selling a broad spectrum of books would be able to comment on the issues most effectively, so specialist outlets, for example Christian book shops, were also omitted.

The list of addresses was obtained by randomly sampling 25% of the relevant book shops, that is, selecting every fourth suitable name from the Directory. The questionnaires were sent to the named Manager where one was listed in the Directory in order to make the study more directed and personal. Where no name was recorded, envelopes were addressed simply to "The Manager". A reply paid envelope was enclosed with each
questionnaire, and an assurance was given that any answers received would be treated in strict confidence. A latest return date approximately six weeks after the date of posting was stipulated, and 52 usable replies were received by that day, representing a return rate of 21%. A follow up survey (see Appendix 7.5), yielded only three further usable replies, increasing the rate of return to 22%.

7.3 Results and Discussion

7.3.1 Samples

For both surveys, the questionnaire included questions relating to the age and gender of respondents in order to gain a general impression of those who replied. Table 7.1 shows the population which was reached by the librarian study, and expresses the results in terms of a cross tabulation, plotting age by gender. It can be seen from the Table that the majority of respondents were female (78.3%) and aged 36-45 (49.1%). Combining age and gender shows that 39.1% of the respondents were both female and aged 36-45, which reflects the accepted model of a senior librarian.

<table>
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<th>Female</th>
<th>Male</th>
<th>Row total</th>
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<td>%</td>
<td>%</td>
</tr>
<tr>
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<td>0.0</td>
<td>1.2</td>
<td>1.9</td>
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<td>0.0</td>
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</tr>
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<td>0.6</td>
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<tr>
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<td>78.3</td>
<td>20.5</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 7.1: Age and gender of respondents to librarian study

In the case of the study of booksellers, it was hoped that the random sampling technique described above would reach a representative sample of the relevant population. The responses to the questions about age and gender acted as a general guide, and Table 7.2 shows the age distribution of the population which was reached. For age and gender, the sample is 57 because two of the questionnaires were filled in jointly by two people.
Chapter 7: The Current and Future Role of Electronic Books within UK Book Suppliers

With regard to gender, the population which was reached was made up of 38 (66.7%) males, 17 (29.8%) females, and 2 (3.5%) who did not answer the question about gender. The sample was broadly representative with regard to the general British workforce, in that the latter similarly shows more men than women, as can be seen from Social Trends 27, Tables 4.1 and 4.3 (Office for National Statistics, 1997). Perhaps more significantly, the questionnaires were addressed to Managers, a group which has traditionally contained more males than females. The sample compares to the figures offered for 1996 in Table 4.8 in Social Trends. Expressing these figures as a percentage, it can be seen that Managers and Administrators are made up of 66% males and 34% females, very similar figures to those replying to the survey.

### 7.3.2 Electronic books

For both surveys, the first question required respondents to indicate from a list what they understood the term "electronic book" to mean. The same list of definitions of the electronic book was presented to both sets of respondents and they were asked to indicate which they believed to be accurate, ticking as many of the definitions as they thought necessary. As can be seen from Table 7.3, the definitions were devised principally according to the medium on which they were presented, as these would be most familiar to respondents. The Table shows that the great majority of respondents to the librarian study (96.3%) considered an electronic book to be "a multimedia CD-ROM book accessible via a desktop computer". Multimedia was an important feature of an electronic book for these respondents, with the five most common choices being the five variations on multimedia documents. Furthermore, texts available over the Internet were judged to be electronic books by a high proportion of respondents (68.9%), which suggests that the Internet was considered to be of almost as
great consequence as CD-ROM and multimedia. Audio or talking books were deemed to be electronic books by very few respondents (8.1%).

It can also be seen from Table 7.3 that almost all of the respondents (92.7%) to the bookseller study considered an electronic book to be a multimedia CD-ROM book accessible via a desktop computer. Since the two most popular choices for a definition involved CD-ROM, the survey indicated that, for the booksellers, CD-ROM is a significant medium on which to store an electronic book. Multimedia was found to be equally important in electronic book, with the five most common choices being the five variations on multimedia documents. Texts available over the Internet were judged to be electronic books by approximately half (56.4%) of the respondents, which suggests that the Internet was considered to be of less consequence than CD-ROM and multimedia. Audio or talking books were deemed to be electronic books by few respondents (14.5%).

Having established the views of respondents on the definition of an electronic book, they were advised about the lack of general agreement about such a definition. It was considered necessary to isolate one of the above definitions for use as a reference point in order to ensure a level of consistency in the answers to both questionnaires. In both cases, the multimedia CD-ROM book accessible via a desktop computer was selected, due partly to the fact that most publishers accept this as the model of the electronic book. It was also chosen because CD-ROM seems to be the medium which is being exploited most at the present time, due in particular to its portability and potential for storage space. Respondents
were therefore asked to reply to the questions according to that definition. This decision was somewhat justified by the fact that the CD-ROM book accessible via a desktop computer was the option most often chosen by respondents to both surveys as an appropriate definition. It is noted, however, that this option could have been selected by some respondents because it had been chosen as the most accurate definition, despite its being highlighted as such after selections should have been made.

Before proceeding with the surveys, it was necessary to establish if respondents to both were stocking electronic books. In the case of the librarians, participants were asked if any of the libraries under their control currently stocked electronic books. If participants replied that the libraries under their control did not stock electronic books, they were asked to go on to rate the list of statements regarding electronic books, since the intervening questions would not be relevant to them. Thirty-two respondents answered "No", representing 19.9% of the total sample and reducing the sample size (n) from 161 to 129 for the intervening questions. The response percentages quoted for these questions have therefore been calculated on the basis that n = 129. These respondents were also asked in which sorts of library electronic books were stocked. The survey found that 91.5% of the authorities which provided electronic books offered access in a main library or libraries, and 61.2% of the authorities offered access in branch or community libraries. It is perhaps not surprising that more authorities provide electronic books in a main library or libraries than in branch or community libraries. Main libraries would be expected to enjoy a greater number of readers than branch or community libraries, therefore, it makes sense to provide electronic books in the places where they would be expected to be available to the greatest number of users. However, it is encouraging that as many as 61.2% of the authorities who replied to the survey offer electronic books in one or more smaller libraries.

In the case of the booksellers, the perceived lack of smaller book shops offering electronic books was confirmed by the fact that only 12.7% of respondents were already stocking electronic books, and 23.6% were definitely opposed to selling them, leaving a total of 63.6% who were still to make a decision. If respondents had indicated that they were definitely opposed to stocking electronic books, they were requested to go on to
question 6 (see Appendix 7.2), since questions 3 to 5 would not be relevant to them (they could answer from question 6 onwards on a hypothetical basis). Thirteen respondents (23.6% of the sample) were definitely opposed, reducing the sample from 55 to 42 for questions 3 to 5.

Since it was recognised that many libraries hold electronic books for reference purposes only, it was considered important to discover the proportion offering them for loan as well, or if any had electronic books solely for the purpose of lending out. Once this distinction had been made, it became relevant that some of the subsequent questions should involve separating the two categories. The survey found that 57.4% of authorities offered electronic books for reference only (i.e. within the library) and 42.6% stocked them for reference within the library and for loan. No respondents offered electronic books for loan only, which suggests that libraries consider making electronic books available for reference within the library to be more important than offering them for loan. The likely reason for this result is that electronic books for reference are available to anyone who comes into the library, whereas in the case of electronic books for loan it is necessary to possess the appropriate equipment in order to be able to read them. It therefore follows that electronic books for reference have the potential to reach the greater number of readers, and are likely to be more satisfactory to libraries.

The reality in public libraries was therefore established, but another question was asked concerning the purpose(s) for which respondents thought electronic books for children should ideally be kept by libraries. The majority indicated they believed they should be for use within the library and for loan (85.3%), with 14.0% selecting use within the library only and only one respondent (0.8%) indicating a preference for loan only. Table 7.4 presents the cross tabulation comparing these two questions, and shows that 43.4% of respondents providing electronic books for reference only believed they should ideally be offering them for reference and loan. A roughly equal number, 41.9% of respondents supplying electronic books for reference and loan thought this was the ideal situation. This compares to only 14.0% of respondents providing electronic books for reference only believing that these were the ideal circumstances.
Chapter 7: The Current and Future Role of Electronic Books within UK Book Suppliers

### Table 7.4: Comparison of purpose(s) for which electronic books are actually kept with purpose(s) for which electronic books should ideally be kept

<table>
<thead>
<tr>
<th>Reality</th>
<th>Ideal</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ref only</td>
<td>Loan only</td>
<td>Ref and loan</td>
<td>Row total</td>
</tr>
<tr>
<td>Ref only</td>
<td>14.0</td>
<td>0.0</td>
<td>43.4</td>
<td>57.4</td>
</tr>
<tr>
<td>Ref and loan</td>
<td>0.0</td>
<td>0.8</td>
<td>41.9</td>
<td>42.6</td>
</tr>
<tr>
<td>Loan only</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Column total</td>
<td>14.0</td>
<td>0.8</td>
<td>85.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Those respondents who had indicated that they offered electronic books for loan were then asked to disclose whether any of these were supplied by Ramesis, a commercial organisation which provides a service called "CD-ROMs-to-Lend". This service allows library borrowers to try out a range of CD-ROMs for a nominal fee (Ramesis, 1998). Of the 55 authorities which had electronic books for loan, 89% indicated that they used the Ramesis CD-ROMs-to-Lend service. This is likely to affect which electronic books are selected for lending out, as borne out by a comment which noted that the children's staff have little input into the selection and promotion of electronic books provided in this way, relying instead on Ramesis to organise the service initially. It is likely that a commercial service of this kind will have different selection criteria and objectives from those of a library, thereby potentially having an effect on the suitability and popularity of electronic books for loan. Widespread reliance on a commercial service might also lead to generally very similar electronic books being provided for loan throughout the UK.

#### 7.3.3 Types of electronic books stocked

**Librarian study**

Respondents were asked about the types of electronic books currently being offered by the libraries under discussion, with regard to those for use within the library only and those for loan. The survey found that reference books were most likely to be offered, both for use within the library (92.2%) and for loan (28.7%). In the case of books for use within the library only, story books were the next most likely category (32.6%), followed by special interest books, e.g. hobbies (23.3%). However, in the case of books for loan, the order was slightly different, with the second most likely category being
special interest books (29.5%) and the third most likely category being story books (20.2%). Thirteen respondents noted types of electronic books other than those listed, most of which seemed to come under the headings of reference or text books, e.g. "fun information books", "non-fiction generally", and "open learning materials". However, five respondents mentioned games and clip art as being other types which they offered, indicating there was some uncertainty over what constitutes an electronic book, since these are CD-ROM software, but would not be classed as electronic books.

Bookseller study
Table 7.5 shows that reference books were the most popular choice for booksellers, both currently and for the future, followed by children's books. There were also other comments suggesting that respondents considered the growth field for CD-ROM books to be mainly in reference and that fiction is not suitable for electronic media. Furthermore, one respondent claimed that most fiction is read on the beach, pointing out that it would be difficult to take a computer system there. Respondents were also asked to give details of types of electronic books other than those listed. Art books and whatever books were requested by customers were named with regard to being sold both currently and in the future, and in connection with future sales only, one respondent identified education books.

<table>
<thead>
<tr>
<th></th>
<th>Currently sell (%)</th>
<th>Likely to sell in future (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference books</td>
<td>14.3</td>
<td>64.3</td>
</tr>
<tr>
<td>Children's books</td>
<td>9.5</td>
<td>47.6</td>
</tr>
<tr>
<td>Special interest books, e.g. cookery</td>
<td>7.1</td>
<td>23.8</td>
</tr>
<tr>
<td>Literature, i.e. poetry, prose and drama</td>
<td>7.1</td>
<td>19.0</td>
</tr>
<tr>
<td>Other</td>
<td>7.1</td>
<td>9.5</td>
</tr>
<tr>
<td>Text books</td>
<td>7.1</td>
<td>40.4</td>
</tr>
</tbody>
</table>

Table 7.5: Types of electronic book being sold/likely to be sold

The general opinion that reference and children's books have lent themselves most easily to the electronic medium and have therefore been the most prevalent (e.g. Langstaff, 1993; Bell, 1995; Lyall, 1994) was therefore confirmed by both of the surveys.
7.3.4 Popularity of electronic books

The librarians were asked about the popularity of electronic books for children as compared to the printed version of the same text. Some respondents found this question difficult to answer, commenting that it is not possible to measure either medium in the same terms, that they did not have the readers' views, and that usage is completely different and so immeasurable. It was also noted that although electronic books are popular, their use may be limited by the number of access points. This is likely to be the case in many libraries. Table 7.6 shows the responses, separating books for reference from books for loan. With regard to books for reference, there was an even division between "about the same popularity as the printed version" (41.1%) and "more popular than the printed version" (38.8%). This shows that young readers are making effective use of electronic texts within the library, and that it is therefore valuable to make them available.

However, in the case of books for loan, the highest percentage were found to be "less popular than the printed version" (16.3%). It is difficult, however, to draw too many conclusions regarding books for loan, since such a high proportion of respondents did not answer this question (71.3%). This is mainly due to the fact that the 55 respondents who were offering electronic books for loan were the only ones in a position to give a meaningful answer to the question. Since a total of 37 respondents did answer, there were 18 respondents who could have answered, but did not.

<table>
<thead>
<tr>
<th>Reference only</th>
<th>For loan</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>About the same popularity as the printed version</td>
<td>41.1</td>
</tr>
<tr>
<td>More popular than the printed version</td>
<td>38.8</td>
</tr>
<tr>
<td>Less popular than the printed version</td>
<td>9.3</td>
</tr>
<tr>
<td>No response</td>
<td>10.9</td>
</tr>
</tbody>
</table>

Table 7.6: Popularity of electronic books
7.3.5 Paying to use electronic books

Amongst the librarians, opinions on children paying to use electronic books for reference only and those for loan differed quite markedly. The survey found that 94.6% of respondents thought that children should not have to pay for the use of electronic books for reference, while only 2 (1.6%) thought they should. In contrast, 39.5% of respondents thought that children should not have to pay for the use of electronic books for loan, while 33.3% thought they should and 16.3% were not sure. There is therefore majority agreement on not charging for electronic books within the library, suggesting that respondents considered these to be like printed books in that no charge is made for using printed books within the library. However, a greater proportion were in agreement on charging for the loan of electronic books, suggesting that they saw electronic books as being similar to audiovisual material, for which charges are usually made. However, a fair proportion of the participants also saw electronic books as being like printed books, since they were against charging for loan, and borrowing printed books does not incur a charge in the majority of cases. This shows a certain level of confusion about whether electronic books are similar to printed book stock or similar to audio visual stock.

With regard to the effect of stocking electronic books on the membership of children's libraries, 74.4% of respondents thought that stocking electronic books generates new members, and 23.3% believed that stocking electronic books makes no difference to membership. None of the respondents indicated that they believed that stocking electronic books discourages new members. This means electronic books can be a valuable asset which can entice children into libraries and perhaps encourage them to use other services whilst there. It also shows that librarians consider electronic books to be attractive to children.

7.3.6 Electronic book selection

Respondents to the librarian survey were asked who should be primarily responsible for selecting their electronic books for children. As can be seen from Table 7.7, the majority of respondents (48.8%) expressed a preference for “a team of qualified librarians specialising in children's services”.
Indeed, the top three options emphasise those working with and for children, while Information Technology (IT) specialists were not considered significant for many of the respondents. Knowledge of children's reading habits was therefore more important than IT expertise when selecting electronic books for children. It could be argued that they believed that electronic books have enough in common with printed books to ensure that book specialists are able to select them more effectively than IT experts. However, comments were made suggesting that selecting electronic books for children creates an implicit need for both a children's specialist and an IT specialist within the library, and that preferably the same person should take on both roles. This is not surprising, since a selector would find it advantageous to be a specialist in both these fields. This is verified by some of the "other person" suggestions, these being the following:

- someone who understands both children's learning (and other children's stock) as well as the electronic book field
- anyone with a good knowledge of children and IT, particularly parental recommendations
- team children's specialist and senior IT manager
- team of IT and children's specialists

The remaining suggestions for other categories were:

- a team of children's specialists with community librarians and subject specialists support
- our stock selection panel, which includes senior acquisitions staff, lending and children's staff
- whatever the normal selection procedure is
- children's panel with a local librarian
- one children's specialist librarian buying for the Borough
A team of qualified librarians specialising in children's services 48.8
The local children's specialist 21.7
The senior manager with responsibility for work with children 14.7
Other person 7.0
The senior manager with responsibility for IT 2.3
The senior manager with responsibility for stock acquisition 2.3
The local generalist Librarian 0.8
The local IT Manager 0.0
No response 2.3

n = 129

Table 7.7: Selectors of electronic books

Respondents were also asked to rate the importance of a number of criteria when selecting electronic books for children for a library. For each criterion a three point scale was presented, marked with the semantic labels "Not important", "Important" and "Very important" respectively. Respondents were asked to tick the box which best summed up their opinion in each case. Likert scaling has been calculated on the selection criteria so that an overall viewpoint is quickly and easily observable. The scale 1-3 has been applied, where 1 corresponds to "Not important", 3 is equal to "Very important", and 2 is the mid point ("Important").

As can be seen from Table 7.8, the criterion considered to be very close to a rating of "Very important", with a scaled value of 2.9 is "ease of use by readers". The suggestion that ease of use is significant is backed up by the grouping together and the high ratings associated with "accessibility" and "ease and reliability of loading and installing". It can be surmised that the quality of the content of electronic books was considered to be significant, since two criteria concerning this aspect were grouped together and rated at 2.8 and 2.7, and the quality of language and illustrations were also grouped together and rated quite highly at 2.6 and 2.5 respectively. In addition, the recency of information was considered consequential, being rated at 2.6. It is likely that usability was believed to be important in terms of the library because the easier an electronic book is to use, the less likely a busy librarian is to have to help a child to read it. It was probably also recognised that greater usability is an advantage to readers, and is likely to mean that they can get more out of a text if it is easy to use. This latter point is linked to the high rating of the quality of content, since the better the quality of a text, the more useful is likely to be the information contained within it.
At the other end of the scale, towards the label "Not important" were situated criteria relating to television and film adaptations, suggesting that respondents did not see these as an incentive for choosing electronic books. This suggests that the librarians did not see other media as having a great influence on the selection of electronic books. It would be interesting to determine whether they felt the same when selecting printed books, since as discussed previously in Chapters 3 and 4, it has been argued that television and film adaptations of printed texts encourage readers to return to the original books (Bradman, 1995). If the librarians believe that television and film adaptations encourage readers to return to the printed text, but not to experience the electronic version, it suggests that they do not consider electronic and printed books to be particularly alike. This is backed up by the low ratings of those criteria concerned with author reputation, best-selling and well-known titles and the popularity of the printed version within the library. Since these criteria are connected with elements of printed books which have the potential to make them popular, their low ratings could suggest that the librarians did not consider electronic books to be particularly similar to printed books because the two media would not necessarily be made popular by possessing the same elements. This is further supported by a comment from a respondent that they do not really think of electronic books as "books" at all. However, there is also the possibility with regard to popularity that librarians do not regard this as an important criterion when choosing printed books, and feel the same way about the selection of electronic books.

The criterion considered least important by the survey was "a classic in printed version" (rated at 1.2), which suggests that librarians do not consider classic texts in the electronic format to be particularly attractive to children. Noting the general feeling in favour of classics discussed in Chapter 4 of this thesis, it could be argued that such a low rating was because the librarians were for classic texts in print, but not so enthusiastic about them in an electronic format. Alternatively, it may be that the respondents to this survey were not in favour of classic texts in either format, and so did not regard them being considered classic as an incentive for acquiring them for the library.
Those criteria concerned with author reputation, best-selling and well-known titles and the popularity of the printed version within the library were grouped together, and were considered to be relatively unimportant. The low ratings of the criteria referring to texts presented in other media, that is, "recently adapted for television, cinema or video" and "television/film novelisation" indicate that the librarians did not see other media as having a great influence on the selection of electronic books. One other scaled value which seems worthy of note is "price", rated at 2.0, which illustrates the importance to librarians of the cost of electronic books. It is not surprising that the cost of electronic books was considered to be "Important", since they generally cost more than printed books, and comments were received about budget constraints. This finding could mean that librarians are discouraged by cost when considering buying electronic texts.

<table>
<thead>
<tr>
<th>Selection Criterion</th>
<th>Scaled Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of use by readers</td>
<td>2.9</td>
</tr>
<tr>
<td>Suitability of content for intended age group</td>
<td>2.8</td>
</tr>
<tr>
<td>Content, i.e. subject matter/story</td>
<td>2.7</td>
</tr>
<tr>
<td>Accessibility</td>
<td>2.6</td>
</tr>
<tr>
<td>Ease and reliability of loading and installing</td>
<td>2.6</td>
</tr>
<tr>
<td>Publication date (for up-to-date information)</td>
<td>2.6</td>
</tr>
<tr>
<td>Quality of language - text and spoken</td>
<td>2.6</td>
</tr>
<tr>
<td>Quality of illustrations</td>
<td>2.5</td>
</tr>
<tr>
<td>Relationship between language and illustrations</td>
<td>2.4</td>
</tr>
<tr>
<td>Added features offered by the electronic medium, e.g. animation, sound</td>
<td>2.3</td>
</tr>
<tr>
<td>Coverage of National Curriculum subject areas</td>
<td>2.3</td>
</tr>
<tr>
<td>Price</td>
<td>2.0</td>
</tr>
<tr>
<td>Author reputation</td>
<td>1.9</td>
</tr>
<tr>
<td>Best-selling title</td>
<td>1.8</td>
</tr>
<tr>
<td>Well-known title</td>
<td>1.7</td>
</tr>
<tr>
<td>Popularity of printed version within the library</td>
<td>1.5</td>
</tr>
<tr>
<td>Recently adapted for television, cinema or video</td>
<td>1.3</td>
</tr>
<tr>
<td>Television/film novelisation</td>
<td>1.2</td>
</tr>
<tr>
<td>Title is regarded as a classic in printed version</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Table 7.8: Criteria for selecting electronic books

A space was left for respondents to note any other criteria not covered by the questionnaire. These included "the organisation of information for retrieval", "attraction for non-library users", "ease of use e.g. index", "compatibility with a broad range of computer operating systems", "the possibility of linking to web site for latest updated information", "marketing by publisher", "suitability for networked use", "coverage of
material for 5-14 year-olds", and "interaction between user and program". All were rated at least "Important".

Respondents were also asked if it was of relevance that the person or people selecting children's electronic books for libraries should be able to see the products before making a choice. The survey found that the majority of respondents (85.3%) considered it important to see products before selecting, while only 7.0% answered in the negative, and 7.7% were not sure. This highlights a problem, since views were expressed that it can be difficult to obtain CD-ROMs on approval in the same way as with conventional book selection, so selectors are forced to rely mainly on reviews in reputable journals, jacket notes or recommendations.

7.3.7 Security issues

Both questionnaires were concerned with whether any additional security problems were experienced as a result of stocking electronic books. The librarian survey found that the number of authorities experiencing extra security problems (41.1%) was equal to the number which were not (40.3%). The remainder were not sure or gave no response.

Those indicating that they did have security problems were asked to give more details, from which it was evident that libraries experience difficulties with both hardware and software in this respect. Respondents commented that the CD-ROMs themselves are very prone to theft due to them being expensive, more desirable than books, and extremely easy to remove and slip into pockets. Many authorities therefore noted the extra security measures they had taken to minimise theft. These included using security cases rather than the original cases, keeping stock at the enquiry desk where stand-alone systems are in operation, tagging, issuing onto a ticket, the use of a booking system or the surrendering of a library card for reference use in the library, staff supervision of those using CD-ROMs, the purchase of jukeboxes to keep disks secure, and machines fitted with locks to prevent access to disks. Many respondents noted that they kept their electronic books on closed access in lockable storage and that staff got them for users and loaded them into a lockable CD-ROM drive. Once loaded on to the PC, respondents noted that the software is prone to tampering and corruption by users. That is, children updating icons and making files with
rude names or gaining access to restricted sections of computers by solving passwords, necessitating the use of locking software. Instances of users rendering CD-ROMs unusable for others or "scrambling" the PCs were quoted, and one respondent made the point that it is difficult to make access to CD-ROM titles relatively easy for children by keeping restrictions to a minimum, but at the same time maintaining a secure, tamper-free system. It was also noted that CD-ROMs demonstrate a higher rate of non-return than books and are easily damaged through rough handling by children or during loading. In one case, children stealing mouse balls had become a major problem, indeed many respondents commented that hardware in general is susceptible to theft and that libraries suffer break-ins resulting in the loss of computer equipment. One respondent believed that there is still no completely effective solution to this problem, however, the securing to walls and tables of machinery and the installation of security wires with locks were cited as measures which had been taken.

The survey of booksellers found that a majority (69.1%) of respondents could foresee electronic media adding to security problems. These respondents were asked to furnish further details, from which it was evident that shoplifting was a source of anxiety for booksellers, most particularly in connection with electronic products. The comments made showed that the small size and high cost of CD-ROM books make them easy and tempting to steal. Respondents indicated that they felt the need to try to lock up CD-ROM books, in some cases storing them separately from the packaging. It was also suggested that stocking CD-ROM books attracts a different type of customer, a group likely to contain those who know electronic products are worth stealing. As one respondent commented, "Book readers are inherently honest; computer users the reverse!" It was noted that electronic books are a desirable product with a high profile among groups most likely to steal, and which thieves find easy to sell on.

It therefore seems that additional security for electronic media is less of a problem to libraries than to small book shops. From those who did have additional security problems it was evident that libraries experience difficulties with both hardware and software in this respect. Both sets of respondents commented that CD-ROMs are very prone to theft because their small size makes them extremely easy to steal, and because they have
a higher value than printed books, causing them to be more desirable. A security problem particular to libraries was identified when it was commented that a higher rate of non-return is related to CD-ROMs.

### 7.3.8 Additional measures

The librarians were asked which measures they thought necessary in order to offer young borrowers access to electronic books. Table 7.9 shows that all those listed were considered to be significant by a clear majority of respondents. The booksellers were asked what actions were necessary to enable them to demonstrate electronic books to their customers. Table 7.9 shows that respondents were more likely to undergo training and spend extra time with customers than to invest in, or make space for additional equipment.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Libraries (%)</th>
<th>Booksellers (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training yourself and your staff</td>
<td>94.6</td>
<td>71.4</td>
</tr>
<tr>
<td>Making space for dedicated equipment</td>
<td>92.2</td>
<td>47.6</td>
</tr>
<tr>
<td>The purchase of additional equipment</td>
<td>90.7</td>
<td>45.2</td>
</tr>
<tr>
<td>Spending extra time with readers</td>
<td>84.5</td>
<td>69.0</td>
</tr>
<tr>
<td>No response</td>
<td>1.6</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table 7.9: Measures necessary in order to offer children access to electronic books in libraries/demonstrate electronic books in a book shop

The table shows that the librarian survey found that the respondents considered training, purchasing and installing dedicated equipment, and spending extra time with readers to be necessary measures when offering children access to electronic books. However, the bookseller survey found that respondents were more likely to undergo training and spend extra time with customers than to acquire or make space for additional equipment. This suggests that the booksellers were opposed to the acquisition of additional equipment, and perhaps considered it more of an expense than extra training and more time spent with customers. Comments were received from both sets of respondents suggesting that such measures are costly, and that budget and staffing constraints were likely to limit the extent of their implementation. With special reference to librarians, this finding reflects a fundamental problem of introducing electronic books into the library, in which expensive additional measures
are considered necessary by librarians who have difficulty implementing them because of limited budgets. This could mean that any electronic books which are introduced into libraries are not exploited to their full potential.

7.3.9 Displaying electronic books

Both sets of respondents were asked what they thought was the best way to display electronic books for children. In the library context, this related to books both for reference and for loan. Respondents were required to tick one box only, however, 14 respondents selected more than one option for either or both of the categories. This has affected the results for this question. The majority of respondents (49.0%) thought that electronic books for reference should be displayed as “icons on a screen to access pre-loaded software”. It is likely that this is related to concerns about security, since CD-ROMs cannot be stolen by readers if they do not have direct access to them. The majority of those who indicated a preference for books for loan thought that they should be displayed “in a separate section of their own” (31.8%). The same was found for the booksellers, where the general opinion was also in favour of displaying electronic books in a separate section of their own. It therefore seems that participants considered electronic books to be a category, rather than an alternative medium offering similar information to printed books. Church (1995) argues that booksellers should consider placing electronic books with printed books of a similar type, since customers are buying information rather than books, and will buy that information in the most accessible format. The study found that only 14.5% of respondents had considered such an idea. This is likely to be because many of the respondents had limited or no experience of actually selling electronic books, and would be led by customers in practice.

Within the library, it was noted that storing electronic books for loan with printed books of a similar type was the ideal solution, but that finding furniture able to take both had been found to be a problem. Other suggestions for displaying electronic books offered by respondents were as follows: "list of files available to borrow and visual display of titles", "printed catalogue showing covers and short review of CD-ROM" and "in children's AV section".
7.3.10 Business concerns

The booksellers were asked if they considered computer games shops and electronic retailers to be rivals in the sale of electronic books. The survey found that around half of respondents considered computer games shops (47.3%) and electronic retailers (52.7%) to be competitors with regard to selling electronic books. The booksellers were also asked if they thought customers would be willing to pay for an electronic book. It was necessary to elect a particular type of electronic book to give respondents a common reference on which to answer the question. As a result of the nature of the thesis, a children's story book was chosen as a universally familiar example. Similar proportions of respondents thought an electronic children's story book should be priced at £1 - £10 (32.7%) and £10 - £15 (34.5%) respectively.

7.3.11 Attitudes about electronic books

At the end of each questionnaire, respondents were asked to rate their level of agreement with a list of statements regarding electronic books. In each case, a five point scale was presented, marked with the semantic labels "Disagree strongly", "Disagree", "Neither agree nor disagree", "Agree" and "Agree strongly" respectively. Respondents were asked to tick the box that corresponded to their level of agreement or disagreement with each statement. Likert scaling has been applied to the results gained from the attitude statements so that an overall viewpoint can be quickly observed. The scale 1-5 has been applied, where 1 corresponds to "Disagree strongly", 5 is equal to "Agree strongly", and 3 is the neutral point. The results are shown in Table 7.10 below. There were six statements included in the bookseller survey, which was conducted first. In order to keep the studies as similar as possible, the survey of librarians subsequently replicated, modified and added to the statements where necessary. The equivalent attitude statements from each study can be seen in Table 7.10.
Table 7.10 Combined attitude statements (in rank order of mean scaled value)

<table>
<thead>
<tr>
<th>LIBRARIAN STUDY Attitude Statement</th>
<th>Scaled Value</th>
<th>BOOKSELLER STUDY Attitude Statement</th>
<th>Scaled Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think that electronic books in libraries lead to a greater need for librarians to learn new technology</td>
<td>4.5</td>
<td>I believe that electronic books have the ability to exist alongside printed books</td>
<td>3.9</td>
</tr>
<tr>
<td>I believe that electronic books have the ability to exist alongside printed books</td>
<td>4.4</td>
<td>I regard electronic books as a valuable complement to the printed items in a library</td>
<td>2.9</td>
</tr>
<tr>
<td>I regard electronic books as a valuable complement to the printed items in a library</td>
<td>4.3</td>
<td>I believe that electronic books reinforce the importance of the librarian's role as an intermediary</td>
<td>4.0</td>
</tr>
<tr>
<td>I believe that electronic books have the ability to exist alongside printed books</td>
<td>3.9</td>
<td>I think that reluctant readers are encouraged to read printed books through electronic books</td>
<td>3.7</td>
</tr>
<tr>
<td>I think that reluctant readers are encouraged to read printed books through electronic books</td>
<td>3.6</td>
<td>I believe that a different type of young reader from usual is attracted by electronic books</td>
<td>3.6</td>
</tr>
<tr>
<td>I regard electronic books as a valuable complement to the printed items in a library</td>
<td>2.9</td>
<td>I think that libraries are being pushed by cultural developments into providing electronic books</td>
<td>3.6</td>
</tr>
<tr>
<td>I think that libraries are being pushed by cultural developments into providing electronic books</td>
<td>3.0</td>
<td>I believe stocking electronic books increases the amount of administration in a library</td>
<td>3.0</td>
</tr>
<tr>
<td>I believe that electronic reference books require more advanced search skills than printed ones</td>
<td>2.9</td>
<td>I think that electronic reference books require more advanced search skills than printed ones</td>
<td>2.9</td>
</tr>
<tr>
<td>I think that the majority of children rely on the library for experience of electronic books</td>
<td>2.8</td>
<td>I think that the majority of children rely on the library for experience of electronic books</td>
<td>2.8</td>
</tr>
<tr>
<td>I consider electronic books to be insignificant with regard to the future survival of the library</td>
<td>2.1</td>
<td>I consider electronic books to be insignificant with regard to the future survival of the library</td>
<td>3.6</td>
</tr>
<tr>
<td>I believe that electronic books are a fad that will eventually disappear</td>
<td>1.7</td>
<td>I believe that electronic books are a fad that will eventually disappear</td>
<td>2.4</td>
</tr>
<tr>
<td>I believe that electronic books will eventually supersede printed books</td>
<td>1.7</td>
<td>I believe that electronic books will eventually supersede printed books</td>
<td>1.8</td>
</tr>
</tbody>
</table>

It can be seen from Table 7.10 that attitude statements numbers 1 and 6 were rated at about the same level by both sets of respondents. The remaining statements reflect fairly large differences in rating, particularly in the case of statements 2 and 3. Indeed, the agreement or disagreement with those two statements was more emphatic in the librarian study than in the bookseller study. Statement 5 also shows a big difference, but the modification of the statement for the library study has altered it too much for a valid comparison to be made.
Chapter 7: The Current and Future Role of Electronic Books within UK Book Suppliers

Librarian Study

The attitude statement which received the highest rating, at 4.5, was concerned with electronic books leading to a greater need for librarians to learn new technology. This is perhaps not surprising, but shows a concern on the part of respondents that electronic books could lead to an alteration in the role of the librarian. It is not surprising that the responses to the attitude statements reflected this opinion. The introduction of media other than print, for example, videos and Compact Discs, is likely to have changed the librarian’s job, and electronic books have the potential to augment the change. This idea was reinforced by the respondents’ agreement (4.0) with the statement that electronic books reinforce the importance of the librarian’s role as an intermediary, suggesting again that they might lead to an alteration in the role of the librarian. However, one respondent commented that librarians must adapt their existing skills to take on this new format and should take a proactive role in reinforcing themselves as intermediaries.

The survey also revealed that librarians have accepted that electronic books can exist alongside and actually complement printed items within the library, as shown by the attitude statements grouped together second and third and rated at 4.4 and 4.3 respectively. This concurs with the relatively low ratings of the statement suggesting that electronic books are insignificant to the future survival of the library (2.1), and the statement that they are a fad that will eventually disappear (1.7). This means that they believed electronic books to be of consequence. A respondent made a valid comment that electronic books are not a fad, but that they may eventually be superseded by subscription services through the Internet. Respondents did not agree that electronic books will go as far as eventually superseding printed books, rating the relevant statement at only 1.7, although the observation was made that electronic encyclopaedias are likely to replace their printed counterparts.

An interesting pairing was found of the attitude statement relating to reluctant readers being encouraged to read printed books through electronic books, rated at 3.7, and that associated with a different type of young reader from usual being attracted by electronic books, rated at 3.6. These ratings are very close, suggesting that respondents were more positive than neutral about these statements and there was some
agreement that electronic books can help in encouraging children to read. This issue which has been discussed in detail earlier in the thesis.

Respondents were also fairly neutral about electronic reference books requiring more advanced search skills than printed ones (2.9), and perhaps more surprisingly, about the majority of children relying on the library for their experience of electronic books (2.8). With regard to the latter, the comment was made that in reality it is hard to gauge, since some children have CD-ROMs at home and most should have experience of them at school. This may explain the rating level for this statement. The rating accorded to the statement concerned with extra levels of administration caused by electronic books was also neutral (3.0). A comment was offered suggesting that there would be extra administration if there was a need for greater training or computer literacy, however this would be negated by more staff with the relevant skills being taken on. It was also noted that all manner of things lead to an increase in administration, and this would not necessarily in itself be a barrier to providing CD-ROMs.

Bookseller Study
Responses to the attitude statements reflected the general opinion that, although the electronic book will prove to be durable, it is unlikely to supersede the equally durable printed book, and that the two are likely to exist alongside one another. As indicated by Table 7.10, there was general disagreement that electronic books are a fad that will eventually disappear; agreement that electronic books can exist alongside printed books; and clear disagreement that electronic books will eventually supersede their printed equivalent. There were additional comments made by respondents which reiterated these attitudes. Furthermore, although it appears that smaller book shop managers accept that electronic books are here to stay, responses to the attitude statements implied that they are not certain about the place of electronic books within their shops. This uncertainty was indicated by respondents agreeing that electronic books are insignificant with regard to the future of their shop, and generally disagreeing that they felt pressured into selling electronic books by larger booksellers. Respondents were neutral about whether electronic books could complement printed books in the book shop. These three results together suggest that the respondents considered electronic books to be rather the province of larger booksellers or other retailers than smaller book shops.
7.3.12 Access to electronic books at home

An attempt was made to determine which types of electronic book respondents to the library study were able to use in their home. A list was provided, of which all those which applied were ticked. The majority (59.0%) did not have access to any electronic books at home. This question was included because it was thought that the level of use of electronic books outside of the workplace might affect the responses given to the questionnaire. However, cross tabulations have been carried out, and no particular effects have been discovered.

7.3.13 Additional comments

Both questionnaires requested additional comments covering subjects not included in the questionnaire.

Librarian Study

Electronic Books as part of a Library's Children's Service

A generally positive attitude towards including electronic books as part of the children's library service was uncovered by the additional comments section of the questionnaire. Several respondents indicated that they had a limited range of electronic books available to the general public, but most also stated that they planned to improve or expand the service. There were also some cases where electronic books for reference within the library were already offered, and plans were being made for the introduction of books for loan. Where no electronic books were provided, the desire to change the situation in the future was expressed, with one respondent commenting that they believed the children of the Borough in which they worked were missing out through lack of electronic books. Importantly, the comment was made that not having sufficient resources to introduce CD-ROM but rushing into providing them because it is the latest trend can present its own problems. This situation can mean that CD-ROMs are not introduced properly, which could be considered to be worse than not providing them at all. Where electronic books had only recently been installed, respondents expressed a concern about the validity of their responses.
Comments were received which suggested that electronic services should be regarded more as an integral part of the public library service, receiving the same attention with regard to such issues as selection, promotion, and stock management as is given to book stock. There were indications that respondents believed that electronic books have a place within public libraries alongside other types of media. Indeed, one respondent explained that attempts were made in their area to encourage customers and staff to look upon electronic books and other IT resources as just another method of retrieving information. There was the suggestion that all media have their strengths and weaknesses, and should be used and stocked accordingly to fulfil the library's role as the provider and supporter of leisure, information, education and culture.

Coping with Change
It was also noted that libraries should be moving with the times, and the potential involvement of libraries in the National Grid for Learning and the People's Network were cited as catalysts for a fairly rapid period of change. It was suggested that if children want access to electronic books, libraries should want to provide them and would be ill-advised to ignore them. Some respondents highlighted the fact that many children are increasingly coming into contact with CD-ROMs in school and at home, and that libraries need to provide them to be seen as relevant. The significance of the compatibility of the library software with the hardware which users are likely to have at home was also noted. The attraction of electronic books to children was conceded when it was commented that providing CD-ROMs can offer an incentive for children who would not necessarily see libraries as relevant and had been responsible for attracting children into the library who had never gone in before. It was also indicated that electronic books were a useful way of encouraging reluctant readers and also of introducing children to research skills, with extensive use of CD-ROMs in homework clubs. The interactive nature of CD-ROM titles was noted as an encouragement to participation and therefore a method of engaging interest.

Libraries as Access Points
Libraries were seen by respondents as an important point of access for electronic books. A comment was received from an area of high poverty levels which stated that in such areas the library is likely to be the only
place where the majority of children can see electronic books. This was reinforced by the suggestion that libraries need to provide information in all formats, and that all must be equally free and accessible, in order to avoid the creation of a nation of "information have and have nots". The idea that libraries should take every opportunity to seek and stock media which increase access for people with special needs was also raised.

The Internet
Comments were also made about the Internet becoming increasingly significant, with the suggestion that the future appears to be leaning towards on-line information as opposed to CD-ROM. It was recognised that the Internet introduces very different challenges from CD-ROM, and that problems are encountered by any library which attempts to cope with both media. It should be noted, however, that the Internet offers many advantages over CD-ROM, for example, easier access and greater choice of source material.

Constraints
However, a general recognition that electronic books have an important place in any library which wishes to help children access information and derive pleasure from books was tempered with the view that many libraries find it difficult to provide the resources necessary to introduce these media properly. It was noted that, although most librarians are willing to expand services to both children and adults by offering electronic books, they are constrained by the limitation of resources and the reluctance of local councils to extend spending beyond guaranteed printed material. Budget, space, time and the necessary expertise have either to be available or found to enable the incorporation of electronic books into the children's library. Of these resources, time appeared to be particularly critical, as several respondents gave examples of reasons why extra support was required by users, leading to additional time pressures for librarians. For example, one comment suggested that "users seem to need a lot of extra time due to unfamiliarity with the technology in general, unfamiliarity with the sources in particular (and) hiccups with loading (and) accessing information sources." This will become less of a problem when dealing with Internet books. At one library within this authority, arrangements had been made for a member of staff assisting
both the Children's and Information Services Teams to be on call at
dedicated times of the day to help users, subject to them booking his time.

Usability
Usability was noted as a significant aspect of electronic books, in that it was
likely to determine the level of use of the books. It is worth observing at
this point that, although this thesis does not deal explicitly with the issue
of the usability of electronic books, it is of significance in the design of
computers and software. A key concept within the subject of Human-
Computer Interaction (HCI), usability is concerned with making systems
easy to learn and easy to use (Preece, 1994). Due to their relatively novelty,
computers are often considered to be difficult to use. Similarly, the
software which accompanies computers is “sometimes poorly designed
and therefore difficult to use.” (Wickens and Liu, 1998). This causes a
variety of negative consequences, the most notable being that user
performance suffers, which is followed by such consequences as confusion,
panic, boredom, etc. The usability of products is of great importance, and is
one of the chief concerns for software interface designers (Wickens and
Liu, 1998). Usability has been described by Shackel (1991) in the following
terms:

“[a product’s] capability in human functional terms, to be used
easily and effectively by the specified range of users, given
specified training and support, to fulfil the specified range of
tasks within the specified range of environmental scenarios.”

The subject of usability makes up an extensive research area, which it is
not necessary to discuss at greater length within the thesis. Readers are
directed to the work by Nielsen (1993) for further information on this
subject.

The significance of the level of usability to be found in the electronic books
in a children’s library is obvious. If they are not easy to use and to learn,
children will have difficulty with them and will be unlikely to seek them
out to read. With regard to the survey, it was claimed that children use
those titles with which they have become familiar either at school or
elsewhere. Interestingly, one respondent described finding some electronic
books to be easier to access than more traditional reference works and so
using the electronic versions more and more. Conversely, there was evidence of staff being wary about using electronic media for answering enquiries. Children have no such worries, however, as it was found that they seem to believe that the CD-ROM has more answers than the book version, and print out lots of material. It was also noted that many children also use CD-ROMs as a quick immediate source of information, that is, they can immediately print off an article on their chosen subject. It was pointed out that the issue of copyright was of importance here, as printing a lot of information from a CD-ROM can be compared to photocopying major sections of printed books.

Hardware
The reliability of the hardware on which the books are being read is just as significant as the reliability of the software. It was commented that "down time", when machines have gone wrong can cause great disappointment to children, and makes librarians reluctant to advertise electronic services too vigorously.

Positioning of Electronic Books
Comments were received that electronic books are not always in the sections of the library designated for children's and young people's services. Such electronic books might not be available for the use of younger readers, but if they are for general use, children might be unaware of their existence within the library. If aware of the books, children might experience difficulties in gaining access to them, since they would be in demand by both adults and children. In addition, parents might be concerned about children entering other parts of the library unaccompanied.

Training
It was suggested that the questionnaire did not adequately address the question of training, since this was thought to be of vital importance, together with strengthening skills and current awareness, in the process of building up electronic services.
Other Issues
Other problems which were mentioned were the need for several PCs at one site, the difficulties of networking multimedia which includes video, the high licensing cost of networking and the difficulties with associated factors, for example, sound, time limits on use, booking systems, charging, and monitoring.

Opinions expressed included a respondent who thought that it is early days in the life of electronic books, and that in a decade, they will be viewed in the same way as story cassettes are now. A desire was also expressed for more articles and professional information on the practicalities of IT for children in public libraries. An issue which merits further research was the suggestion that an interesting comparison might be made between traditional text publishing and electronic publishing with regard to the issue of the integrity of publication. Another suggestion worthy of further research was that it would be interesting to know more about the reasons children have for using electronic books in libraries, that is, whether it is to support homework or more general interests, or to develop reading skills.

Bookseller Study
The idea was advanced that CD-ROM is only a step towards online access to electronic books, therefore causing the effect on book shops in the longer term to be a more complex issue than that of physical stocking and handling. The issue of advances in technology was also raised through the suggestion that electronic books will only supersede printed books if a handheld "terminal" with a battery life of at least 6 hours and a full colour screen of 6" x 4" can be produced. Another respondent expressed the opinion that CD-ROM has almost come to the end of its life, making way for the next media format.

The question of cost was raised, with one respondent commenting that stocking, displaying and demonstrating electronic books would probably be time consuming and expensive, and noting that it would not be viable without support from publishers and wholesalers. A second respondent believed that much of the current output is extremely overpriced for the majority of the public, and considered that it is primarily aimed at public
and educational libraries which do not have to budget funds in the same way as families. A third respondent claimed to have given serious consideration to stocking electronic books but decided against because of high cost and lack of customer interest. A fourth respondent was of the opinion that a "best-seller" CD-ROM only achieves 300-400 sales nationwide, and considered there to be a general poor quality of content. These issues, added to competition from specialist computer shops, led the respondent to see no reason to "waste space and time on a high cost low margin product". Indeed, competition was cited by two respondents as the reason for having ceased to stock electronic and multimedia items.

There were comments about the durability of printed books, with one respondent claiming to be ready to give up bookselling if electronic books were completely to supersede the printed word, but believing that enough people like "books as books" to ensure their survival. Another respondent considered it inevitable that the electronic environment would begin to assert itself, but stated a belief that there will always be a place for printed matter.

It was clear from their comments that respondents were concerned about what they considered to be the variable, mainly poor quality of the content of existing electronic books. Questions should have been asked on this subject. As a result of this perceived poor quality, and claiming to be an educationist as well as a bookseller, one respondent wanted to be able to guide teachers about electronic book purchase, but cited pressure of work as the main obstacle.

Finally, there was one respondent who contemplated the subject from a more ethereal perspective, commenting that "Humanity must develop spiritually in order to cope with electronic media - otherwise we're sunk."

7.5 Conclusions

It can therefore be seen that the librarians were keen to embrace the new technology of electronic books. The majority of participants believe that electronic books are durable, but that they will not supersede printed books, instead existing alongside the printed items within a library. They think that offering electronic books will change their role, but are willing
to undertake the additional measures necessary to achieve this. This is promising in terms of the present research, as it should mean that those people who are influential within libraries (i.e. librarians) will attempt to ensure that electronic books are available.

A high proportion of libraries are already offering electronic books for use within the library, although fewer are lending them out like printed books. A small majority of libraries in the sample offered electronic books for reference only rather than for reference and for loan. This did not reflect the ideal situation, which was thought to be to offer electronic books for reference and for loan. The fact that electronic books are available to children in the library would seem to benefit those without equipment at home. However, if the number of computers available in the library is limited, this would not be so advantageous. A large proportion of those libraries which do lend out do so on a commercial basis, which means that the librarians themselves will have limited influence on the electronic books available. It is, however, important for ensuring maximum take-up of books that a library’s individual clientele is catered for, and this may not occur if an outside agency is doing the selecting. Many librarians believe that electronic books attract new members to the library. This suggests that they believe that electronic books are attractive to readers, which is an issue of great relevance to the present research. Since most libraries are keen to attract new members, particularly younger readers, to the library, this will render them even more likely to offer electronic books. Budgetary concerns are significant to librarians, and may limit their activities in relation to introducing electronic books into libraries. This obviously has the potential to restrict children’s access to electronic books via public libraries, which are likely to be a major source of electronic texts for a majority of young readers.

With regard to booksellers, the perceived lack of smaller book shops entering the field of selling electronic books was borne out by the responses to the questionnaire. The expected difficulties connected with smaller books shops stocking electronic books were also evident from the survey. However, the results showed that the majority of respondents believe that electronic books are durable, and can exist alongside the printed items within a book shop. Most participants also did not think that electronic books will supersede printed books. There is a general
uncertainty amongst booksellers about the place of electronic books in smaller book shops.

A lack of resources within smaller book shops could also be detected from the survey. The monetary costs associated with stocking electronic books which were evident from the survey were the higher unit cost, the need for extra security, the necessity for more space and equipment, and the requirement for training staff. Larger booksellers will have more resources at their disposal to meet these costs, which might explain why more are venturing into the field of electronic books than smaller retailers. It is also possible that the unit cost of electronic books will fall, as is typical with new technology, and the attitudes of booksellers may therefore change towards them. This would be a valuable subject for a future study.

In addition to booksellers and librarians, it is likely that parents and schools will have an interest in children using electronic books. A search for existing surveys and studies of computer equipment in homes, schools and public libraries has been carried out in order to establish the level of access which children are likely to have to electronic books in these places. The results of the search are presented in the next Chapter of the thesis.
Chapter 8: The Current Access of Children to Equipment for Reading Electronic Books

8.1 Introduction

Having considered both the opinions and role of librarians and booksellers on the subject of electronic books, it is important to try to establish the current position of parents and schools on the subject. Parents and schools will have a certain influence on whether or not children have the ability to read electronic books. One aspect of this is through providing the equipment on which to read electronic texts. There is little or no research on the attitudes of parents and representatives of schools concerning electronic books. Since the time limits of the present thesis did not allow a study of such attitudes, it was determined to consult the variety of literature which exists detailing the amount of homes, schools and public libraries which are providing the equipment on which to read electronic books. This Chapter will therefore investigate recent studies and surveys which measure the level of access that children have to computer equipment at home, at school and in public libraries. It is thought that gaining an impression of the availability of computer equipment to children will give an indication of their ability to gain access to electronic books. Since the author's model of the electronic book has been stated to be the type which up to now has typically been presented on CD-ROM, it would be useful also to consider children's access to computers with CD-ROM drives. It is recognised, however, that not all computers have CD-ROM drives, and that having a CD-ROM drive does not guarantee access to electronic books. A search for surveys and studies of the existence of computers and where possible, CD-ROM capability, in schools, homes and public libraries has therefore been carried out.

The figures quoted here are the most recent that it was possible to find, since it is recognised that the situation with regard to computer ownership and availability is a rapidly changing one. For example, and as will be discussed later in this Chapter, home ownership of computers has
increased dramatically in the last ten years (Social Trends, 2000), and is quite likely to continue rising. In addition, an initiative which is likely particularly to affect provision of IT in schools and public libraries is the NGfL (National Grid for Learning), "... a facility for developing educationally valuable content on the internet and for providing access for that content through schools, colleges, universities, libraries, homes, workplaces and elsewhere." (p3) (Government Statistical Service, 1999). The People’s Network Project (People’s Network Online, 1999) is also likely to affect IT provision in public libraries, since the project aims to connect all public libraries in the UK to the Information Superhighway by the end of 2002.

8.2 School

The Survey of Information and Communications Technology in Schools 1999 was prepared by the Government Statistical Service (1999) for the Department for Education and Employment (DfEE). The survey is intended to present a summary of the information available on the level of availability and use of Information and Communications Technology (ICT) in schools in the UK. Similar surveys of primary, secondary and special schools have been carried out by the DfEE since 1985 under various titles. In this case, the schools were surveyed during March 1999. The sample for the survey was selected as being representative of the various types of school throughout the country. Responses were received from 55 per cent of the primary, 49 per cent of the secondary, and 52 per cent of the special schools contacted. The authors of the survey recognise the relatively low response rates, and have therefore compared the distribution of responding schools to the distribution in the original and introduced adjustments to ensure that the resulting figures are representative of the characteristics of the chosen sample (Government Statistical Service, 1999, p3). Table 8.1 illustrates the results of the survey which are relevant to the thesis.
As can be seen from Table 8.1, secondary schools have by far the highest average number of computers and average number of CD-ROM drives per school. In addition, the average number of pupils per computer is lower in secondary schools than in primary schools, suggesting that pupils in secondary education currently have the best access to computer equipment.

The deployment of computers for teaching and learning in the sample schools was reported by their respective head teachers, and the responses which were received are shown in Table 8.2. It can be seen that the majority are permanently located in either an ICT Room or in a study area or classroom. It therefore seems that access to the computer equipment is likely to be restricted to certain children and to particular time periods.

A study which surveyed school libraries, and so is not concerned with general provision of computers within the schools involved is the Survey of United Kingdom Secondary School Libraries (Library Association, 1997). Commissioned by the Library Association (LA), the survey was the first of its kind and was carried out by the Survey and Statistical Research Centre (SSRC) at Sheffield Hallam University. The survey entailed a self-completion questionnaire being sent to a sample of schools, of which 56 per cent responded (n = 1075). Although this survey is not concerned with
the entire school, it can give some indication of the level of computers to be found in secondary school libraries. Figure 8.1 below illustrates the distribution of the number of computer workstations within the libraries of the sample schools. The percentages are proportions of the total number of schools.

![Pie chart showing distribution of computer workstations in school libraries in 1997](image)

**Figure 8.1: Distribution of the number of computer workstations in school libraries in 1997 (Library Association, 1997)**

The number of computer workstations in school libraries was, perhaps not surprisingly, found to be subject to regional variations. The number of schools from Northern Ireland, Scotland and Wales was higher than the national proportions would suggest to allow for comparison on aspects of provision and practice across regions. This only slightly distorts the overall UK figures (Library Association, 1997). Table 8.3 details these regional differences, illustrating that school libraries in England and Wales tend to be better resourced than those in Wales and Scotland.
Chapter 8: The Current Access of Children to Equipment for Reading Electronic Books

<table>
<thead>
<tr>
<th>No. of workstations</th>
<th>Wales</th>
<th>England</th>
<th>Northern Ireland</th>
<th>Scotland</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>11.3</td>
<td>8.9</td>
<td>13.4</td>
<td>3.8</td>
</tr>
<tr>
<td>1-4</td>
<td>55.0</td>
<td>50.4</td>
<td>71.1</td>
<td>50.0</td>
</tr>
<tr>
<td>5-9</td>
<td>18.8</td>
<td>26.0</td>
<td>12.4</td>
<td>35.4</td>
</tr>
<tr>
<td>10-19</td>
<td>11.3</td>
<td>11.7</td>
<td>3.1</td>
<td>10.1</td>
</tr>
<tr>
<td>20+</td>
<td>3.8</td>
<td>3.0</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Sample size</td>
<td>80</td>
<td>631</td>
<td>97</td>
<td>158</td>
</tr>
</tbody>
</table>

Table 8.3: Distribution of computer workstations in school libraries in 1997 by region (Library Association, 1997)

With regard to CD-ROM equipment, the survey found that overall, 87 per cent of school libraries have at least one CD-ROM player. It was found that CD-ROM players are less common in independent schools (75 per cent) and special schools (36 per cent) than in the more general state schools. The survey found that, as the size of school in terms of pupil numbers increased, so generally did the percentage having a CD-ROM player. The exact figures are shown in Table 8.4 below.

<table>
<thead>
<tr>
<th>Size of school</th>
<th>% with CD-ROM</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50</td>
<td>34.4</td>
</tr>
<tr>
<td>50-100</td>
<td>30.8</td>
</tr>
<tr>
<td>100-500</td>
<td>72.6</td>
</tr>
<tr>
<td>500-1000</td>
<td>92.6</td>
</tr>
<tr>
<td>1000-2000</td>
<td>96.6</td>
</tr>
<tr>
<td>2000+</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 8.4: Percentage of UK secondary school libraries with CD-ROM player, according to size of school in 1997 (Library Association, 1997)

The survey also uncovered some regional differences relating to ownership of CD-ROM equipment, with Scotland having the highest proportion of school libraries with a CD-ROM player (92.7%). Northern Ireland was close with 91.9%, whilst the figure for England was 83.8% and for Wales 75.8%.

The Survey of secondary school library users (Spreadbury and Spiller, 1999) is another study concerned just with the school library. The survey took place in 1998 and aimed to investigate and compare the library service in the state and independent sectors. Four schools situated in London were involved in the survey – two state comprehensives and two independent schools. Since the study involved such a small sample, and the results relate only to computer provision within the libraries of the schools, this
survey is being used as an illustration of the proportion of computers having CD-ROM drives. Table 8.5 shows the numbers of computers available in the library of the four schools, and the number of those which had access to CD-ROMs.

<table>
<thead>
<tr>
<th>School</th>
<th>No. of computers in the library</th>
<th>No. with CD-ROM access</th>
<th>Percentage with CD-ROM access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive (A)</td>
<td>2</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Comprehensive (B)</td>
<td>4</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>Independent (C)</td>
<td>9</td>
<td>9</td>
<td>100</td>
</tr>
<tr>
<td>Independent (D)</td>
<td>4</td>
<td>3</td>
<td>75</td>
</tr>
</tbody>
</table>

Table 8.5: Number of computers and computers with CD-ROM in each school library in 1998 (Spreadbury and Spiller, 1999)

The study also found that 40 per cent of the pupils never used the computers in the library for typing up schoolwork. The most common reason for this was that the children used computers elsewhere, either at home or at other school locations. Another factor was that the library had limited numbers of computers, and their most important functions were for access to CD-ROMs and/or the Internet. This demonstrates that perhaps libraries might be a good indicator of children's access to electronic books, since the library computers tend to be dedicated to access to CD-ROMs and the Internet. The survey also looked at pupils' general use of the CD-ROMs provided in the library. Thirty one per cent overall said they did use the CD-ROMs, 35 per cent said they did "sometimes" and 25 per cent said "No – but I use them elsewhere", either at school or at home. Only 12 per cent said that they never used CD-ROMs.

The reality of the availability of computers in schools can be seen in a small scale setting in the study described in Chapter 6. The study involved pupils from three different primary school classes, and found that each class had one computer available in the classroom, and that the pupils were getting access to 30 to 45 minutes of computer use every two to three weeks.

Livingstone and Bovill (1999) carried out a survey of 1300 children during the months of April and May 1997, using a detailed questionnaire administered through a computer-assisted interview at home. The survey contains a lot of information which is of great relevance to the present
Chapter 8: The Current Access of Children to Equipment for Reading Electronic Books

Chapter, and so it will be quoted fairly extensively, particularly in sections 8.2 and 8.3. The survey included research into children using IT at school, the authors deciding not to ask about access separately from use, because they felt that every pupil was likely to state that there is a computer somewhere in their school. Livingstone and Bovill consider that the most important question is whether the children personally use the school equipment. Indeed, the difference between access and use is extremely pertinent to the present discussion, since access without use is of little advantage in schools, homes, libraries and indeed in any other situation (Livingstone and Bovill, 1999). As can be seen from Table 8.6, at school 88 per cent of children personally use the PC, while 49 per cent personally use CD-ROM.

<table>
<thead>
<tr>
<th></th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All (%)  Boy (%)  Girl (%)</td>
</tr>
<tr>
<td>Use PC at school</td>
<td>88   90    87</td>
</tr>
<tr>
<td>Use CD-ROM at school</td>
<td>49   52    47</td>
</tr>
</tbody>
</table>

Table 8.6: Percentage of participants using PCs at school in 1997 (Livingstone and Bovill, 1999)

8.3 The Home

8.3.1 Household surveys

There is agreement amongst the recently conducted surveys consulted on the subject, that approximately a third of households in this country own a home computer. Social Trends 30 (2000) covers the period 1998-99, and gives the percentage of households in Great Britain owning a home computer as 34 per cent. The annual Family Spending (1999) survey also covers the period 1998-99, and offers the figure of a third (33 per cent) of households in the survey having a home computer. Lastly, a leisure intelligence report called In-Home Interactive Media by the marketing intelligence company Mintel (1999) quotes a 1998 survey by Target Group Index (TGI) of around 25,000 adults, which found that 33 per cent of households in the UK owned a computer. These figures represent a "dramatic increase in the ownership of home computers" since 1988, with the proportion almost doubling from 18 per cent to 34 per cent in that period (Social Trends, 2000). Although it has been established that a third
of households in the UK own a computer, it has not been possible to
discover the proportion of these which are multimedia, i.e. they have a
CD-ROM drive. This is obviously important, because PCs without a CD-
ROM drive will be unable to run an electronic book on CD-ROM.

As might be expected, access to PCs within homes is not uniform across
the UK. The Family Spending survey (1999) found that “... only 10 per cent
of households in the lowest income group owned a computer compared to
nearly 70 per cent in the top income group.” (p 140) With regard to
regional statistics, the survey found that at 39 per cent, households in
London and the South East recorded the highest level of ownership of
home computers, whilst households in Northern Ireland had the lowest
at 18 per cent. A further indication of the inequalities which exist is
evident in Livingstone and Bovill (1999), whose survey found that
children from “... working-class families are significantly less likely to
have access to ... personal computers” in the home (Ch. 4 Pg. 13).

It should also be remembered that the relation between ownership, access
and use of computers is not a simple one, and that the existence of a
computer in a home does not necessarily mean that any children living
there either wish to, or are allowed to, use it. Therefore, care must be taken
when attempting to draw conclusions relating to children from surveys of
computers in the household (Livingstone and Bovill, 1999). That is, these
figures represent a maximum, and the true number of houses in which
children use the computer on any regular basis is likely to be lower.

Nevertheless, it is of interest to note from Social Trends (Office for
National Statistics, 2000) that during 1998-99 households with children\footnote{In Social Trends (ONS, 2000) Children are defined as “never-married people of any age who live with one or both parent(s)” (p226)}
were far more likely to have a computer (49 per cent of all households
with children) than one person households (28 per cent) and those aged 60
and over (4 per cent). This could mean that children are the main users of
the computer in a house. A more concrete indication of children’s level of
use of home computers is offered by the leisure intelligence report by
Mintel (1999) discussed above. The figures in Table 8.7\(^2\) show that children were the main users of the computer in 22 per cent of households in 1998.

<table>
<thead>
<tr>
<th>Main user</th>
<th>1998 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self/partner</td>
<td>72</td>
</tr>
<tr>
<td>Son/daughter</td>
<td>22</td>
</tr>
<tr>
<td>Someone else in household</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 8.7: Main user of home computers in 1998 (Mintel, 1999)

### 8.3.2 Surveys of children

Livingstone and Bovill’s (1999) study was a survey concentrating on the views of children, and Table 8.8 shows the percentage of participants who had PC in the home, and unusually, the percentage who had PC with CD-ROM capabilities. The figures are broken down by gender and age.

<table>
<thead>
<tr>
<th>Gender Age</th>
<th>All</th>
<th>Boy</th>
<th>Girl</th>
<th>6-8</th>
<th>9-11</th>
<th>12-14</th>
<th>15-17</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>53</td>
<td>50</td>
<td>56</td>
<td>53</td>
<td>51</td>
<td>53</td>
<td>54</td>
</tr>
<tr>
<td>PC with CD-ROM</td>
<td>31</td>
<td>29</td>
<td>33</td>
<td>35</td>
<td>30</td>
<td>31</td>
<td>28</td>
</tr>
</tbody>
</table>

Table 8.8: Percentage of participants having PC and PC with CD-ROM in the home in 1997 (Livingstone and Bovill, 1999)

Therefore, Livingstone and Bovill found that a greater number of their participants (53%) had a home computer than did the three other surveys discussed above (33%/34%). There is a difference between the two surveys in that one is a study of households, whereas the other is an examination of individuals. Therefore, the difference might be explained by Livingstone and Bovill interviewing multiple members of one household. However, this is unlikely to account for there being such a difference, and it could perhaps be a result of the survey sample not being entirely representative in the case of Livingstone and Bovill. It is worth noting that the study described in Chapter 6 of the thesis had similar results to that carried out by Livingstone and Bovill. The study found that 15 of the 30 participants (50 per cent) involved in the research had access to a computer at home. Seven participants (23 per cent) claimed that the computer to which they had access included a CD-ROM drive, 4 (13 per cent) said the computer did not have a CD-ROM drive, and four (13 per

\(^2\) The percentage figures in Table 8.7 add up to 103 due to rounding up of figures (Butcher, 2000).
cent) did not know either way. The small number of participants in the study (30) means that no definite conclusions can be drawn, however, the survey was in line with Livingstone and Bovill on the number of home computers, and might give some idea of the reality of the availability of computers in the home.

The above figures for home computers all relate to the general ownership of households. However, having a PC in the home may indicate potential access, but ownership does not necessarily mean that the equipment is being used. Livingstone and Bovill (1999) recognised this fact, and measured children's use of the PC at home in addition to their level of access. The results are shown below in Table 8.9.

<table>
<thead>
<tr>
<th></th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All (%)</td>
</tr>
<tr>
<td>Have a PC at home</td>
<td>53</td>
</tr>
<tr>
<td>Use PC at home</td>
<td>42</td>
</tr>
<tr>
<td>Have a PC with CD-ROM at home</td>
<td>31</td>
</tr>
<tr>
<td>Use PC with CD-ROM at home</td>
<td>21</td>
</tr>
</tbody>
</table>

Table 8.9: Percentage who had PC at home compared with percentage who had used any PC at home in 1997 (Livingstone and Bovill, 1999)

As can be seen, the figure for those using PC at home (42%) is lower than for those who have access to a PC at home (53%). As discussed above, this is likely to be because children might not always be interested in, or parents may not always be willing to allow, use of domestic IT equipment. However, those computers which are intended for primary use by a child, and are therefore most likely to be used by a child, are those to be found in the child's bedroom. Fact File 2000 (1999) offers the figure of a total of 8 per cent of children (persons under the age of 16) having a computer in their bedroom (10 per cent of boys and 6 per cent of girls). As shown by Table 8.10 below, Livingstone and Bovill (1999) got slightly different results, finding that 12 per cent of survey participants (aged 6-17 years) had a computer in their own bedroom (16 per cent of boys and 8 per cent of girls). Once more, Livingstone and Bovill include figures for the percentage of PCs with CD-ROM, and in this case approximately one third of the computers in bedrooms had a CD-ROM drive.
Chapter 8: The Current Access of Children to Equipment for Reading Electronic Books

<table>
<thead>
<tr>
<th></th>
<th>All (%)</th>
<th>Boy (%)</th>
<th>Girl (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>12</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>PC with CD-ROM</td>
<td>4</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 8.10: Percentage of participants having PC and PC with CD-ROM in their own bedroom in 1997 (Livingstone and Bovill, 1999)

In both cases, more boys than girls have a computer in their bedroom, which is in agreement with the popular view that girls experience limited access to electronic media (Spender, 1996). This is further reinforced by another finding of Livingstone and Bovill (1999) that “Boys are more than twice as likely to have the family’s only computer located in their room, or to have an additional PC of their own.” (Ch. 4 Pg. 15) See Table 8.11 for detailed figures.

<table>
<thead>
<tr>
<th>Location</th>
<th>Boy (%)</th>
<th>Girl (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child’s room and elsewhere</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>Child’s room only</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Elsewhere only</td>
<td>62</td>
<td>83</td>
</tr>
</tbody>
</table>

Table 8.11: Location of PC in the home in 1997 (Livingstone and Bovill, 1999)

With regard to social grade differences, however, although middle class households are much more likely to have a PC somewhere in the house, the situation respecting computers in children’s bedrooms is rather different. That is, the survey found that “... there are no social grade differences in the numbers of children having a PC in their own room.” (Ch. 4 Pg. 15) It therefore seems that levels of access may be disparate, but that levels of use might be more alike across social grades.

8.4 Public Libraries

It should be noted that all the figures found for computers in public libraries relate to general access. It has not proved possible to find out how many are set aside solely for the use of children. Table 8.12 shows the number of computers in public libraries in the UK for the period 1998-1999, as presented by Fact File 2000 (1999).
Chapter 8: The Current Access of Children to Equipment for Reading Electronic Books

<table>
<thead>
<tr>
<th>Total no. of libraries with computers available for public use</th>
<th>2,997</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of libraries with access to:</td>
<td>Catalogue</td>
</tr>
<tr>
<td></td>
<td>Internet</td>
</tr>
<tr>
<td></td>
<td>CD-ROM</td>
</tr>
<tr>
<td>Total no. of computers available for public use</td>
<td>10,639</td>
</tr>
<tr>
<td>% of computers with access to:</td>
<td>Catalogue</td>
</tr>
<tr>
<td></td>
<td>Internet</td>
</tr>
<tr>
<td></td>
<td>CD-ROM</td>
</tr>
</tbody>
</table>

Table 8.12: No. of computers in UK public libraries in 1998-99 (Fact File 2000, 1999)

Batt’s *IT in Public Libraries* (1998) is one in a series of regular surveys carried out on a local authority basis. This particular survey had a 99 per cent rate of return, and Table 8.13 shows the provision of public access computers by local authority type for 1997 as found by Batt.

<table>
<thead>
<tr>
<th>Type of authority</th>
<th>No. of authorities</th>
<th>No. of public access computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counties (England)</td>
<td>35</td>
<td>29</td>
</tr>
<tr>
<td>Unitaries (Wales)</td>
<td>22</td>
<td>18</td>
</tr>
<tr>
<td>London</td>
<td>34</td>
<td>25</td>
</tr>
<tr>
<td>Mets</td>
<td>36</td>
<td>35</td>
</tr>
<tr>
<td>N. Ireland</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Scotland</td>
<td>33</td>
<td>23</td>
</tr>
<tr>
<td>Unitaries (England)</td>
<td>26</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>191</td>
<td>141</td>
</tr>
<tr>
<td>% of Total PCs</td>
<td>73</td>
<td></td>
</tr>
</tbody>
</table>

Table 8.13: Provision of public access micros by local authority type in 1997 (Batt, 1998)

As shown in Table 8.14, the survey also records the number of service points in which machines are provided as well as the number of machines that are available, with regard to both open learning PCs and PCs for hire. These two sets of data have been kept separate because, as Batt points out, they are not mutually exclusive. This is due to it being likely that there are service points where both categories are provided, and it being possible, although perhaps less likely, that the same machines will serve the two purposes. The base figure of 4,095 service points is also used to calculate that 9 per cent of libraries have open learning resources and that 6 per cent have PCs for hire.
A study which was carried out in 1998 and is described in Chapter 7, found that 80 per cent of the local authorities in the UK which responded had a branch or branches which were currently stocking electronic books. Most of these were for reference only. Creaser's *Survey of library services to schools and children in the UK 1998-99* (1999) asked local authorities specifically about CD-ROMs available in the children's library. The survey found that 73% of UK authorities offered CD-ROMs, but usually for reference use only. The difference between these figures may be the difference between authorities which have CD-ROMs available in the children's library and those which have them available generally in the library, but not specifically in the children's section. However, the figures are similar enough to conclude that they represent the true picture of CD-ROM provision in public libraries.

### 8.5 Summary of Findings

A general picture of computer availability in schools, homes and public libraries is presented by the main conclusions which can be drawn from the above review of existing studies and surveys. These are as follows:

#### 8.5.1 School

- There is an average 13, 8 and 4 pupils per computer in primary, secondary and special schools respectively
- There is an average of 7.2 CD-ROM drives per primary school, 26.6 per secondary school and 10.8 per special school
- Pupils in secondary education currently have the highest level of access to computer equipment
The majority of computers in schools (68% for primary, 81% for secondary and 69% for special schools) are permanently located either in a study area/classroom or ICT Room.

- 87% of secondary school libraries have a CD-ROM player.
- 88% of children use PC at school.
- 49% of children use CD-ROM at school.

### 8.5.2 The home

- According to surveys of adults, approximately one third of households own a home computer.
- According to surveys of children, approximately 50% of them have access to a home computer.
- Households with children are the most likely type of household to have a computer.
- A child is the main user of the computer in 22% of households.
- 42% of children make use of the PC at home.
- 21% of children make use of the PC with CD-ROM at home.
- Between 8% and 12% of children have a computer in their bedroom (more common amongst boys than girls).
- Approximately 4% of children have a PC with CD-ROM in their bedroom.

### 8.5.3 Public Libraries

- 64% of public libraries offer access to CD-ROM.
- 46% of computers in public libraries have access to CD-ROM.
• 73% of local authorities have CD-ROMs available in children's libraries, usually for reference use only

In conclusion, it can be argued that, with regard to access in schools pupils in secondary schools are more likely to have access to both computer equipment and CD-ROM drives than pupils in primary schools. This clearly disadvantages younger children, in whom it is important to engender an early interest in computers. The age group being studied in the present thesis attend primary schools, and so would be at a disadvantage according to the figures brought to light by the literature search. As for access in the home, the literature search has shown that quite a large proportion (between one third and one half) of households contain a computer. In addition to this, homes with children are the type of household most likely to own a computer. Given the additional fact that there will be comparatively less competition for a computer at home, it can be argued children's access to a PC at home is therefore more assured than it is at school. General access to computers in libraries is good in terms of both hardware and software. Taking into account new developments in the field of electronic books, however, it will soon perhaps be more relevant to investigate the levels of access to e-book readers and the Internet. Evidence suggests that access to both of these types of electronic book is either increasing or set to increase within the public library sector (People’s Network Online, 1999; Ormes, 2001).

This Chapter has described the final study of the thesis. There now follows a discussion of the global results and conclusions of the thesis.
Chapter 9: Discussion and Conclusions

"'The age of the book is almost gone'"
(Steiner, 1988)

This chapter aims to synthesise the research findings presented by the thesis. Many definitions and classifications of the electronic book were revealed by the literature review, including the type of application, the type of presentation employed in the realisation of the book, a taxonomy based on the type of information that is embedded in the electronic book, a classification based on the format or interface of the book, and the medium on which the system is published. The author's own model of the electronic book was influenced by the findings of the literature review, making use of a structure based on layers in order to ensure that the study is portable irrespective of any (inevitable) changes in technology. The layers were as follows: the medium on which the book is presented (e.g. Internet, CD-ROM), the content (e.g. fiction, non fiction), the presentation (e.g. book metaphor, input and output devices) and the functionalities (e.g. audio, animation). These are the significant features of an electronic book, which operate independently by overlaying each other. The electronic book model was described as being the kind which up to now has typically been presented on CD-ROM, and which recognises the importance of the book metaphor within the interface. The research findings will now be discussed in relation to the specific hypotheses listed in Chapter 1.

9.1 Children as Readers of Electronic Books

The first hypothesis introduced the notion that electronic books have the ability to encourage children to read more. Much of the emphasis of the thesis has been on studying children as users of electronic books. A recurring theme of the thesis has been the idea that children's interest in reading is declining, and that new technologies and media are largely to blame for this decline. It is said that the rapid evolution of modern technologies such as film, television, video and computers has led children to become a television generation (or computer generation) accustomed to experiencing a wealth of other media in addition to print as
part of everyday life. Being exposed to a large number of images, young people are developing very sophisticated levels of visual literacy, which are affecting both their attention span and their desire to read. The suggestion has therefore been raised that the appeal of computers is causing the electronic environment to become more important, particularly to those children who do not respond well to traditional print media, and who are reluctant to read. This idea is of significance to the electronic book, since it combines the advantages of the printed book with the capabilities of the computer, thereby adding more to the text and pictures. The electronic book exhibits the potential to be more attractive to children than the printed book, and may therefore play a part in encouraging children to read.

However, the literature review identified the fact that no work has been discovered which considers the issue of whether electronic books do actually encourage children to read more. Moreover, it is relevant to consider the dual questions of whether electronic books encourage children to read more electronic books, and whether they encourage children to read more printed books. These would, in fact, be difficult questions to investigate in experimental terms. It was not possible to include an investigation of this issue in the present thesis due to time constraints. Chapter 3 of the thesis does, however, take the form of a discussion of the extent to which electronic books might encourage children to read, with regard both to reading more printed books and to reading more electronic texts. Given the lack of literature on this subject, and the general scarcity of research on children's interaction with electronic books generally, it proved difficult even to construct a discussion of this issue. Noting the importance to children of non-print media, a consideration was therefore made of children's exposure to alternative, non-print versions of literary texts. Since these are so popular amongst children, it was concluded that the success of electronic books may depend on how similar they are to media such as television, film and video. This discussion has highlighted the scarcity of research on this issue, and the fact that there is scope for much further work. The discussion has brought the arguments together and taken a first step towards experimental research in the area.
Chapter 4 of the present thesis also examines the issue of encouraging children to read more. Current concerns that children do not choose to read classic texts, in particular, combined with the additional effects that electronic books can offer and the prevalence of electronic versions of classic texts, has led to the speculation that electronic versions might prove appealing to young readers. Importantly, the Chapter incorporates a discussion of the classics and offers evidence showing that children are not currently reading them. It connects ideas about classics with ideas about electronic books, suggesting ways in which the electronic book plays a part in encouraging reading. Chapter 4 noted that children are gaining an increasing awareness of the classics from versions other than print, which reinforces the idea that electronic books should incorporate features from non-print media with elements of the printed book. Both Chapter 3 and Chapter 4 take the form of discussions, bringing together and considering all the relevant writing on the subject, and demonstrating that the role of electronic books in encouraging reading is clearly an area in which further work is necessary.

In contrast to the consideration of classic texts as a type of literature that currently demonstrates scant appeal for young readers, the thesis includes a study of why children are attracted to those authors whose work they do enjoy reading. Identifying the elements which make an author popular would mean these could be incorporated into electronic books to make them more desired as reading material. Roald Dahl is taken as an example of a writer whose children's books are extremely popular, and a study investigates the reasons for his success in the words of young readers themselves. The thesis has contributed generally to the body of knowledge about Roald Dahl by carrying out an extensive literature review, which confirmed his popularity in terms of sales figures and surveys of children's reading preferences and habits. The literature review also demonstrated that many adults disapprove of, or even dislike, the writing of Roald Dahl, while many children are thoroughly in favour of his work, but that the opinions of young readers themselves had not been canvassed in any meaningful way. The study which was undertaken therefore attempted to fill the resultant gap in research, and made use of a novel methodology to achieve this.
The study found that the participants in the study enjoyed reading Dahl's work, and found some qualities and characteristics in common between the different books written by him. The two themes of humour and scariness appeared to be particularly significant to the participants, both in relation to Dahl texts and to the other texts which they were considering. The relatively close matching between participant interpretations of the common Dahl texts which was established by the study indicated that these texts do have some characteristics in common, rendering them different from other books. The definition of exactly what these characteristics are could help to explain the popularity of Dahl. The study was partially successful in contributing to this definition, however, it is clear that further work is required with regard to this issue.

The study represents a first step towards determining some of the constituent parts of the texts which children enjoy reading which could, in turn, establish a recommendation for the elements which electronic books should include in order to attract young readers. As noted previously, the thesis has been concerned with the importance to children of reading. Roald Dahl is of great significance in this regard, since so many children enjoy reading his work. It could therefore be argued that Roald Dahl encourages reading - children enjoy his books and once they have read and enjoyed one text, they are very likely to go on and read more.

The second hypothesis introduced in Chapter 1 of the thesis postulated that the medium on which a book is presented affect the reader's comprehension of it. This arose from the argument that encouraging children to read electronic books might affect their reading, particularly their level of comprehension. Since concerns have been expressed about the effect of the electronic medium on children's comprehension of electronic books, Chapter 6 of the thesis is concerned with this issue. It describes an investigation of whether reading the electronic book affects children's comprehension of the story as compared with reading printed books. The literature review found work which suggested that the added effects which are incorporated into electronic books might affect the reader's comprehension of such texts. However, little concrete evidence of this idea was found, therefore, this thesis has added to the body of knowledge on this issue by devising an experiment which investigates it. As noted previously, there was no evidence to suggest that the added
effects and visual dimension offered by the electronic book reduced participants’ comprehension of the text. Indeed, there was an indication that electronic books might actually aid the reader’s comprehension of a text rather than hinder it. The study is of significance to the remainder of the thesis because if children are either encouraged to read more electronic books, or are increasingly choosing to read them, it seems important to investigate how they compare with printed books. In addition, the generally held view that girls experience limited access to electronic media and are therefore disadvantaged by a lack of the skills required to make use of them was not reflected by the study. The female participants did not encounter any particular difficulties with reading the electronic text, and their comprehension of the story was not affected by reading it in the electronic format.

It is clear, however, that readers’ comprehension of electronic books is an area in which further work is necessary. As noted in Chapter 6, the study undertaken for the present thesis entailed some methodological issues which any future work based on this study should attempt to address. It was suggested also in Chapter 6 that future work could observe how electronic books are used practically in an everyday setting. This could comprise of a more typically real world exposure to electronic texts than that in the experiment described in the present thesis. This could be achieved by making available in the homes of participant families one or more electronic books for an extended period of one to two weeks.

9.2 Book Suppliers

If children do indeed read electronic books, it is important to consider from which sources they will obtain them. The third hypothesis in Chapter 1 introduced the idea that the embracing of the technology of electronic books is having an effect on the principal book suppliers – book shops and libraries. In both cases, the literature review identified work which recognises that these two suppliers are likely to be affected by the advent of electronic books, but little or no evidence of the actual effects, or of the views of the people involved. The current research addressed the concerns of librarians and booksellers in the form of two major questionnaire studies. It is of great importance to take into consideration
the opinions of those who are providing electronic books either through selling them in shops or lending them through libraries. Since these people have a direct involvement in the provision of electronic books, their views are of great significance, as they provide a picture of the true position of electronic books at the present time. Their opinions give an indication of the likely acceptance or rejection of electronic books within their organisations. Indeed, in some cases, these views could actually influence the acceptance or otherwise of the electronic book within particular libraries and book shops. The current thesis has therefore added to the body of knowledge of electronic books in book shops and children’s libraries by canvassing the opinions of booksellers and librarians respectively.

As discussed in the literature review, there is much debate about whether electronic books might supersede printed books. The conclusion was drawn that the prevailing view throughout the 1990s has been that the two are likely to exist alongside one another, however, very little evidence was discovered of the actual situation with regard to this issue. The work in this thesis has contributed to the knowledge of this area by canvassing the opinions of both booksellers and librarians on this question. The two questionnaire studies presented respondents with a list of statements regarding electronic books, some of which relate to the possibility of their ability to supersede printed books. In both cases, responses to the attitude statements reflected the belief that the electronic book will prove to be durable, but is unlikely to supersede the equally durable printed book, and that the two are likely to exist alongside one another. Furthermore, it has been argued that the respondents to both surveys believed that the electronic book will complement rather than eradicate the printed book. Indeed, as demonstrated by the survey of libraries, the situation of printed and CD-ROM electronic books existing alongside one another is the current position in many public libraries. The results of the study suggested that the respondents believed that the hybrid, or polymedia, library was the model which was likely to endure.
9.3 Children's Access to Equipment for Reading Electronic Books

The fourth hypothesis in Chapter 1 proposed that parents and schools will also have a role in making electronic books available to children. A review of the relevant literature confirmed the sub-hypothesis that there was little or no research existing which investigated the attitudes of parents and representatives of schools on the subject of electronic books. Since parents and schools will have a certain influence on whether or not children have the ability to read electronic books, it was thought important to try to establish the current position of these bodies on the subject. The time limits of the thesis did not allow for a comprehensive study of this issue, however, research showed that the provision of equipment on which to read electronic books is a significant way in which parents and schools may influence children having the ability to read them.

By reviewing current studies and surveys measuring the level of access that children have to computer equipment at home, at school and in public libraries, it was possible to gain a thorough idea of the availability of computer equipment to children, since there was sufficient literature for this purpose. However, it was less easy to be sure how many electronic books were being read on the available equipment, not least because of the different methods of storing electronic books which exist. The research was therefore only partially successful in showing the role of parents and schools, although this was anticipated to a certain extent before the research was undertaken.

9.4 Other Issues

There now follows a discussion of themes which are central to the thesis, but not directly related to one particular hypothesis.

9.4.1 Advantages and Limitations of Electronic Books

The many limitations and advantages of electronic books have been summarised in the literature review. One of the most notable of the
limitations concerns the significance of ensuring that electronic books are as portable as printed books. As discussed in the literature review, numerous writers have stressed the importance of portability. Interestingly, the questionnaire studies described in Chapter 7 indicated that the majority of respondents to both consider the desktop computer to be the principal method of presentation for the electronic book, thereby suggesting that they judged portability for electronic books to be either less significant or less achievable than for printed books. It is noted, however, that the survey did not request ideas about desirable features. In contrast, the singular study which has investigated children's opinions about electronic books (Children's Literature Research Centre, 1996) found that respondents were actively positive about the portability and associated privacy of the printed book. Until recently, electronic books were not nearly as portable as printed books, however, the e-book readers discussed above are approaching the ideal of the portable electronic book and are largely overcoming the problem.

Although the thesis has not been primarily concerned with investigating the advantages and limitations of electronic books, it is valuable to deliberate whether any of those listed in the literature review have been encountered during the course of the research. The most notable of these concerns the problems of access to the equipment required to read the electronic book. An entire Chapter (8) of the present thesis is devoted to an investigation of the recent studies and surveys measuring the level of access which children have to the equipment on which to read electronic books. The Chapter indicates that there are 13 and 8 pupils per computer in primary and secondary schools respectively, and that 88% of children use a PC at school, while between 33% and 50% of households have a home computer. A child is the main user of the computer in 22% of households, while 42% of children make use of a PC at home and 21% make use of a PC with CD-ROM at home. In 1998-99, 65% of the public libraries in the UK had computers available for public use, and 64% offered access to CD-ROM, while 73% of local authorities had CD-ROMs available in children's libraries, usually for reference use only. There is also provision for CD-ROM use in 46% of computers in public libraries. This research shows that the picture of access to computer equipment for children is fairly inconsistent across the three sources considered. The highest level of access appears to occur in schools, however, computers are shared between
several children so that opportunities for general access, and more particularly to electronic books, are likely to be few and far between. Access in public libraries may be erratic, since equipment is often heavily used, and pre-booking may therefore be necessary. In addition, the period of use in a public library is unlikely to be of long duration. The best opportunity for access will naturally be at home, where only between 33% and 50% of children will have access to a home computer (the former figure is likely to be closest to the real picture).

The survey of children’s librarians investigated the current position with regard to both electronic book software and the hardware necessary for reading the software. With regard to software, the survey showed that none of the respondents were offering electronic books for loan purposes only, and the likely reason for this result was assumed to be that electronic books for reference are available to anyone who comes into the library, whereas in the case of electronic books for loan it is necessary to possess the appropriate equipment in order to be able to read them. It therefore follows that electronic books for reference have the potential to reach the greater number of readers, and are likely to be the most acceptable option for libraries. The majority of respondents thought that the ideal situation was for electronic books to be available for use both within the library and for loan, thereby reaching the absolute maximum number of readers. When investigating hardware the difficulties of access were encountered, both in terms of the equipment to which borrowers have access elsewhere, and the level of access which may be provided within the library. The survey found that the respondents considered purchasing and installing dedicated equipment to be necessary measures when offering children access to electronic books. However, comments were noted which suggested that such measures cause security problems and are costly, and that budget and staffing constraints were likely to limit the extent of their implementation. This finding reflects a fundamental problem of introducing electronic books into the library, in which expensive additional measures are considered necessary by librarians who have difficulty implementing them because of limited budgets. This could mean that access to electronic books will not be as widespread in libraries as might be hoped, therefore limiting children’s access to them, particularly those children who rely on libraries for the majority of their reading material. The current thesis has thus identified that problems are
Chapter 9: Discussion and Conclusions

encountered by children's librarians which are associated with the limitation of the electronic book represented by having to obtain access to the necessary equipment.

The study of booksellers described in Chapter 7 found that respondents were more likely to undergo training and spend extra time with customers than to acquire or make space for additional equipment. This suggests that the respondents were opposed to the acquisition of additional equipment, and perhaps considered it more of an expense than extra training and more time spent with customers. In common with the study of librarians, however, the booksellers voiced the opinion that all of the measures necessary for stocking electronic books were costly. This shows that, in common with potential purchasers, providing access to the equipment necessary to read electronic books represents difficulties to those selling them.

Therefore, it can be argued that the work carried out for the current thesis has borne out the suggestion that gaining access to the equipment necessary to read electronic books remains a significant limitation of the medium.

9.4.2 The Book Metaphor

The book metaphor has been discussed at some length in the literature review, since it is of particular significance to the electronic book and is a common theme throughout the literature as a whole. Its significance in the author's definition of an electronic book has already been noted in Chapter 1. As discussed previously, the book metaphor concerns making use of the familiarity of the conventional book form to introduce the new concept of the electronic book. Readers of the printed book have a commonly held prior knowledge of how it works which maximises its usability. Existing mental models and manipulation skills associated with printed books are therefore used in the design of electronic books in order to make them more usable by readers. As a result, it is argued that the use of the book metaphor ensures that the electronic book remains as much like the printed book as possible and so maximises its own usability.
The book metaphor can be seen in practice in the electronic book used in the study of children’s comprehension of printed and electronic texts (Chapter 6). There is a strong suggestion of the CD-ROM text being book-like, with the first intimation being when the reader opens up the story and sees the representation of a printed book emanating from a bookshelf (see Appendices 6.7.1 to 6.7.3 for an illustration of the electronic Peter Pan behaving in this way – the Journey to the Centre of the Earth text operates in the same way). The representation of the book then appears to open, revealing the contents page, which takes the form of a map (see Appendix 6.8). The contents take the form of numbered chapters in the same way as a printed book (see Appendix 6.8), each screen of information is set out like the page of a book, has a white background with black text, and has a turned-down corner to suggest the qualities of a printed page (see Appendix 6.1). A bookmark with a tasselled end, depicted in computer graphics, may be inserted to keep a note of a particular page (see Appendix 6.1). The theme is continued with the addition of menus shaped liked printed books (see Appendix 6.8), and lastly, but perhaps most significantly, the graphics surrounding each screen or page depict an open book. The additional elements incorporated into this particular electronic book are: narration with text which is highlighted as it is read; sound effects; music; animation; hypertext links which explain the more difficult words and concepts (see Appendix 6.7.12); and various examples of interaction. In particular, the electronic text includes “hot spots” (see Chapter 6) for entertainment value, and the contents in the form of a map. The latter is a very good example of the electronic book making use of an accepted element of the printed book and adding an extra dimension via the capabilities of the computer.

It therefore seems valuable to consider whether making use of the book metaphor maximises the usability of electronic books. In the case of Journey to the Centre of the Earth, although none of the participants in the study had extensive experience of electronic texts, none of those in the group reading the electronic version exhibited any particular problems with it. Indeed, the indications from the study described in Chapter 6 were that the added effects and visual dimension offered by the electronic book did not reduce participants’ comprehension of the text, but rather might actually have been beneficial to readers in their comprehension of electronic books. The possible effect of a novelty factor related to
participants' inexperience of electronic texts is noted here, however, there were clear indications that reading the electronic version of the text did not compromise the level of understanding of the story. It can therefore be argued that incorporating the book metaphor into an electronic book renders it sufficiently similar to a printed book in order not to affect the level of comprehension (see Landoni and Gibb, 2000; Landoni et al, 2000).

The next question to be considered is whether the electronic book can also encourage certain children to read more than they are presently doing.

9.5 Conclusions

The following conclusions may therefore be drawn from the thesis. They are shown here mapped directly onto the relevant hypotheses and sub-hypotheses from Chapter 1 of the thesis:

9.5.1 Electronic books have the ability to encourage children to read more

Sub-hypothesis: The electronic book adds more to the text and pictures which may render it attractive to children, particularly those for whom visual literacy has become very significant.

Sub-hypothesis: Electronic books may have the power to bridge the gap between print and other media, and thereby encourage children to read more printed and electronic books.

Conclusion: The thesis has demonstrated that television, film and audio (including radio) versions of texts do encourage the reading of printed editions (and vice versa). It therefore seems acceptable to argue that electronic books may have the potential to exhibit the same effect, depending on how similar electronic books are to television, film and audio. However, further research into this subject is needed.

Sub-hypothesis: The electronic medium might encourage children to read more classics, a genre which is not currently a popular type of reading material amongst children.
Conclusion: The discussion within the thesis has demonstrated that children are reading less classics in print and obtaining an increasing amount of experience of them from non-print versions, notably film and video. The potential for electronic books to remedy this situation has been identified and reinforced by the thesis.

Sub-hypothesis: Identifying the elements which make an author popular would mean these could be incorporated into electronic books to make them more desirable as reading material.

Conclusion: The study of author popularity indicated a general level of agreement between participants, particularly with regard to certain themes. The study highlighted that Dahl texts do have some characteristics in common, rendering them different from other books. The definition of exactly what these characteristics are would be useful as an aid to making recommendations as to which elements should be included in electronic books to attract young readers. The study has been partially successful in contributing to this definition, although it is clear that further work is required in this area.

9.5.2 The medium on which a book is presented affects the reader’s comprehension of it

Sub-hypothesis: Reading the electronic book will affect children’s comprehension of the story as compared with reading the printed book.

Conclusion: The concern that children’s comprehension of electronic books will be compromised by their added effects appears to be unfounded, indeed, indications are that electronic texts may actually aid comprehension of the story.
9.5.3 The embracing of the technology of electronic books is having an effect on the principal book suppliers

Conclusion: The current and future role of electronic books within children's libraries in Great Britain from the point of view of the relevant librarians has been largely unknown up to now. The study of librarians has demonstrated that they have a positive attitude towards including electronic books as part of the children's library service, and the majority would ideally like to offer electronic books both for reference and for loan.

Conclusion: The opinions of booksellers on the subject of electronic books are presently under-reported, but the study has shown that smaller book shops have not entered the field of selling electronic books in great numbers, and there is general uncertainty about the place of electronic books in smaller book shops.

9.5.4 Parents and schools have a role in making electronic books available to children

Sub-hypothesis: The provision of equipment on which to read electronic books is one way in which parents and schools may influence children having the ability to read them.

Conclusion: The problems associated with gaining access to the equipment on which to read electronic books continue to be a critical issue.

Sub-hypothesis: It should be possible to determine the level of access which children have to electronic books via the variety of literature which exists detailing the amount of homes, schools and public libraries which are providing the equipment on which to read electronic books.

Conclusion: Children's access to computers and to electronic books is inconsistent across the major sources represented by libraries, schools and homes.
In Chapter 1 of the thesis, it was noted that, in exploring the relationship between the electronic book and the printed book, it was found that there exists a general belief that electronic books and printed books can and will exist alongside one another. A conclusion which can be drawn from the thesis is that the relationship between the printed book and its electronic counterpart is a symbiotic one. Electronic books borrow features from the printed book, most notably in the form of the book metaphor; they currently exist alongside one another; and neither is likely to be superseded by the other. It can also be concluded from the thesis that the portability of electronic books is currently not a major issue, however, this is likely to change with the increasing prominence of dedicated e-book readers.

9.6 Recommendations for Future Work

The prevailing image of the field of electronic books is that it is currently largely influenced by the rapidly changing developments in the technology. This is particularly true of electronic books which are presented on dedicated readers and other similar devices (see Open eBook Forum, 2000). There is therefore currently a requirement for a greater level of concentration on the user and their engagement with the electronic book, rather than there being such reliance on developments in technology. Evidence shows that the increase in the acceptance and use of electronic books has been, and continues to be, a slow process (see Chapter 1 of the present thesis). It could be argued that electronic books stored on CD-ROM have been fairly popular, although it has already been noted earlier in the thesis that certain publishers have scaled down their activities in this area. It should also be noted that the subjects in the study described in Chapter 6 had little or no knowledge of electronic books of this (or any) kind. Furthermore, there is evidence that e-books of the type which are viewed on dedicated readers (e.g. RocketBook) or specialist software (e.g. Glassbook) have not been very well received (see Dearnley and McKnight, 2000).

The need for greater research involving the users has been reinforced by the thesis. In particular, the study of user interaction with electronic books
found that children's comprehension of a story does not appear to be affected adversely by reading it in the electronic medium. It was clear that this is an area in which further work is necessary. In addition, no experimental research has been discovered on the subject of whether electronic books do actually encourage children to read more. Indeed, given the lack of literature on this subject, and the general scarcity of research on children's interaction with electronic books generally, it proved difficult even to construct a discussion of this issue. This indicates extensive opportunities for further work, and would provide a chance to concentrate on the users of electronic books. This is a very important and topical area for study, due to the current concerns about children not reading and their interest in the visual media. It is noted, however, that it would prove to be a difficult area to investigate in experimental terms.

As discussed above, it was possible to gain a thorough idea of the availability of computer equipment to children at home, at school and in public libraries, via an extensive literature review. However, it was less easy to be sure how many electronic books were being read on the available equipment, not least because of the different methods of storing electronic books which exist. The research was therefore only partially successful in showing the role of parents and schools, and so a questionnaire study similar to those investigating the opinions of librarians and booksellers should be undertaken in the future.

A lack of research into the opinions of publishers on the subject of electronic books has also been identified within the thesis (see Chapter 1). There is evidence to show that publishers are currently wrestling with this issue (see for example, E-Books 2001 Conference, 2001), and this is an area which reveals extensive opportunities for further research. Examples of issues which would merit investigation include licencing, relationships with authors, the various formats for digitising, retention of content control, the question of print on demand, and digitising back catalogues.

A proportion of the work described in the thesis has begun the process of investigating the place of electronic books in libraries and book shops. The study of booksellers has shown that electronic books are not particularly significant within smaller book shops. Future research should perhaps
concentrate more on larger book selling outlets, which are more likely to be stocking electronic books.

More importantly, in the age of the hybrid library, there is currently extensive scope for research within all kinds of libraries. The work completed as part of the thesis has shown that public libraries in particular are keen to embrace the technology of electronic books. It is recognised that this has concentrated on electronic books presented on CD-ROM, however, the wider field of electronic books are becoming a challenge with which public libraries are currently wrestling (Ormes, 2001). Other kinds of libraries are also recognising the significance of electronic books, and are trying to decide how best to integrate them into the library (e.g. Projects HERON and PELICAN within academic libraries). Indeed, some academic libraries already include a certain amount of e-books in their stock (see netLibrary, 2001), and some public libraries are experimenting with offering e-books to their readers by circulating dedicated readers (Cox and Ormes, 2001). It therefore seems that much research on the introduction and use of electronic books could be undertaken within libraries.

"And where lies the book? The notion of the demise of the book needs swift dispatch. The book will continue to flourish for many kinds of publishing and will coexist happily with electronic publishing. Libraries will continue to collect and care for books."

(Lang, 1996)
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<th>Author</th>
<th>Votes</th>
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<td>340</td>
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<td>Pratchett, Terry</td>
<td>168</td>
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<td>Blume, Judy</td>
<td>154</td>
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<td>Fine, Anne</td>
<td>121</td>
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<td>Daniels, Lucy</td>
<td>103</td>
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<td>103</td>
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<td>Westall, Robert</td>
<td>63</td>
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<tr>
<td>Jacques, Brian</td>
<td>61</td>
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<tr>
<td>Jennings, Paul</td>
<td>60</td>
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<td>Deary, Terry</td>
<td>46</td>
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<tr>
<td>Martin, Ann M</td>
<td>42</td>
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<tr>
<td>Tomlinson, Theresa</td>
<td>42</td>
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<td>41</td>
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<td>41</td>
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<td>38</td>
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<td>36</td>
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<td>Townsend, Sue</td>
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<td>Pascal, Francine</td>
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<td>32</td>
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Triads

(9 elements and 10 constructs):

| C1 | 1  | 2  | 3  |
| C2 | 4  | 5  | 6  |
| C3 | 7  | 8  | 9  |
| C4 | 2  | 5  | 8  |
| C5 | 3  | 4  | 9  |
| C6 | 6  | 3  | 8  |
| C7 | 7  | 5  | 3  |
| C8 | 8  | 4  | 1  |
| C9 | 2  | 9  | 6  |
| C10| 4  | 7  | 2  |

(8 elements and 6 constructs):

| C1 | 1  | 2  | 3  |
| C2 | 4  | 5  | 6  |
| C3 | 7  | 8  | 1  |
| C4 | 2  | 5  | 8  |
| C5 | 3  | 6  | 7  |
| C6 | 4  | 3  | 8  |

APPENDIX 5.2
### APPENDIX 5.3: Focused grid consisting of data relating to Dahl texts only

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**APPENDIX 5.3: Focused grid consisting of data relating to Dahl texts only**
Figure 5.4.1: Focused grid for participant 1

Figure 5.4.2: Focused grid for participant 2

APPENDIX 5.4: Individual focused grids
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<th>Participant 4</th>
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<td>6</td>
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<tr>
<td>Girl as main character</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>No funny characters</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Strange clothes</td>
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<td>5</td>
</tr>
<tr>
<td>Animals which talk</td>
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<td>3</td>
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<tr>
<td>No mums and dads</td>
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<td>3</td>
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<tr>
<td>Monsters</td>
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<tr>
<td>Not funny</td>
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<tr>
<td>No animals</td>
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Figure 5.4.3: Focused grid for participant 3

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<td>7</td>
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<tr>
<td>Serious</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Main character is child</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Children's story</td>
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<tr>
<td>Not scary</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>No people killed</td>
<td>7</td>
<td>8</td>
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</tbody>
</table>

Figure 5.4.4: Focused grid for participant 4

APPENDIX 5.4: Individual focused grids
APPENDIX 5.4: Individual focused grids
For weeks we travelled deeper into the bowels of the earth. My own calculations had shown that at the present rate of descent we should take about five and a half years to reach the centre of the earth!

Completely absorbed in my work as we went along, I was examining a piece of granite by means of the lamp when I suddenly realised I was completely alone.

Evidently I had become separated from my companions and had entered a different gallery.

My situation could be summed up in three awful words: Lost!! Lost!! LOST!!!

In the middle of this anguish a new horror took possession of my soul. I dropped the lamp.

Then, as I wandered aimlessly around, the earth failed me. I found I was falling down a vertical gallery.

My head struck against a sharp rock and I lost consciousness. Death seemed about to claim me.
When I came to I saw my uncle and Hans looking down on me.

'He lives! He lives!' cried my uncle.
I had awoken in a charming grotto,
adorned with magnificent stalagmites,
glittering in all the colours of the rainbow.
The floor was a soft and silvery sand.
No lamps were needed. A bright light penetrated through a narrow opening in the wall of the grotto.

Then I heard a vague murmur, like waves breaking on a beach, and the whistling of a wind.

I thought I must be dreaming. Or perhaps we had returned to the surface of the Earth.

Then I heard my uncle speaking.

'It is indeed a miracle that you were not killed a thousand times over,' he said. 'But rest now, for tomorrow we must set sail.'

'Sail?' I cried, more bewildered than ever.

'Yes, indeed,' said my uncle. 'Tomorrow we must be ready to go on board.'

My uncle tried to restrain me, but I scrambled to my feet and rushed outside the grotto. What a surprise greeted me.
In my wildest imagination I would never have conjured up such a scene. ‘The sea — the sea,’ I cried.

A vast expanse of water spread before us, until it was lost in the distance.

The tremendous vault over our heads — the sky, so to speak — appeared to consist of clouds of swirling water vapours.

Electric currents created astonishing plays of light among them, reflected on the enormous cliffs that reared up on all sides.

But for me the effect was sad and melancholy. For I realised that far above those clouds there must be a heavy roof of granite, weighing down on us.
After being imprisoned underground for 47 days, it was a delight to breathe this salt-sea air.

'Well,' said my uncle. 'Do you feel strong enough to go for a stroll?'

'Certainly,' was my ready answer. 'Nothing would give me greater pleasure.'

In the distance I saw a strange forest. It consisted of straight trunks with tufted tops, like sunshades.

'It's a forest of mushrooms!' cried my uncle.

He was right! There were thousands of them, growing up to 40 feet in height.

New wonders were everywhere. Around us were other groups of trees, like those on Mother Earth, but of a phenomenal size.

There were flowering ferns as tall as pines, and gigantic grasses.

'Astonishing! Magnificent! Splendid!' cried my uncle. 'Here we have humble garden plants which became trees in the first centuries of the Earth.

'Look around you. No botanist ever before gazed on such a sight!'

'It is like a mighty hot-house, my boy - but let us remember it could also be a vast menagerie...
'Look what we are standing on — these are the bones of prehistoric animals.'
I looked at the bones that lay scattered around. They resembled dried-up tree trunks. I could even name some of them.
'Here is the lower jaw-bone of a mastodon,' I said. 'The molars of a dinotherium — and the thigh-bone of the biggest of them all, the megatherium.
'But how could such giant beasts come to be in this granite cavern?'
'There is a simple answer,' replied the Professor.

'At one time the Earth consisted only of an elastic crust, subject to alternate upward and downward movement due to the law of gravity.
'And there must have been landslides, with large portions of sedimentary soil being cast into huge and mighty chasms.'
'That's possible,' I remarked. 'But if prehistoric animals lived down here, it is likely one of those monsters may now be lurking behind one of those steep rocks.'
'Then we have no time to lose,' cried my uncle. 'We must set sail tomorrow.'
The next morning we set off in search of more adventures.
Hans had managed to make a raft out of fossilised tree trunks he had found. It was about ten feet long and five feet wide, bound together with stout ropes.
With us we carried our instruments, luggage, food and a generous supply of water from a nearby stream.
Hans had made a rudder, mast and sail allowing us to guide the raft with ease.
The trouble was we were no longer going down, but sailing to the unknown.
The Professor grumbled: 'This voyage on a raft over a pond annoys me. We are not progressing with our discoveries.'
Often we tried to find the depth of the water, using an iron bar attached to a long rope. One day we had great difficulty reeling it in. We soon found out why.
On it were deep marks, as though it had been crushed between two hard objects.
'They are the marks of teeth!' I cried.
And I wondered what jaws must the owner of such molars be possessed of!

Suddenly, Hans pointed to where, about 200 yards away, a huge black mass was moving up and down.
My worst fears were realised.
'It is a colossal monster!' I cried in terror.
‘Look!’ observed the Professor in some agitation. ‘It’s a huge sea lizard of terrible size and shape. And there’s also a giant crocodile. See his great jaws and rows of monstrous teeth. And a whale!
A whale! Look at that enormous tail.’

Two hideous monsters spotted us and advanced towards the raft. I picked up my rifle in desperation, though I knew it could have had little effect against them.
Then they made a rush at one another.

My uncle coolly watched their gigantic struggle through his telescope.
‘I thought so!’ he cried. ‘One is that most fearful of all prehistoric reptiles, the Ichthyosaurus.’

‘And the other?’ I asked.
‘A serpent, concealed under the hard shell of a turtle – the Plesiosaurus.’

They attacked one another with tremendous fury. Such a giant combat had never before been seen by mortal eye.

*Journey to the Centre of the Earth* (Verne (1864) pub. EuroPress Software 1997)
Page 7 (Print out from Electronic Book)
The battle went on for hours. We crouched on the raft, weapons pointed towards them, and determined not to perish without a struggle.

Suddenly, the creatures disappeared beneath the waves. Several minutes went by in silence. Was this combat to end in the ocean depths?

Then an enormous mass rose out of the water. It was the head of the great Plesiosaurus. The terrible creature had been mortally wounded.

I could see nothing of his enormous shell-like body. Only his serpent-like neck, which twisted and curled in the agony of death.

It struck the water like a gigantic whip, then wriggled like a worm cut in two.

Water spurted in all directions.

Then its violent movements slackened, and at last the body of the mighty snake stretched out across the now calm water.

Danger over for now, our voyage continued even further into the unknown.
Many days passed without further incidents. Our observations showed we had already travelled nearly 800 miles across this sea and that our position was exactly under England.

It was now August 21, and we could sense the calm weather we had been enjoying was about to change.

A distant sound of thunder became louder and louder, and suddenly we were in the midst of a wild and raging tempest.

It came from the most distant corners of the mighty cavern. It roared, it yelled, it shrieked with the glee of demons.

The raft rose and fell with the storm. It moved faster and faster before the wind. Would the storm never end?

We appeared doomed. The mast and sail were carried away. I saw them swept into the sky to a great height.

We were frozen in terror.

Then a ball of fire, half white, half blue, the size of a 10-inch bombshell, swooped towards us, darting here, there and everywhere with great rapidity.

It approached my uncle who fell to his knees to avoid it. Then it came towards me as I stood pale and shuddering in the dazzling light and heat.

It danced around my feet. They seemed to be riveted to the deck.

Instruments, tools, firearms all clanged together with an awful noise. I realised what had happened. The electric globe had magnetised all the iron on board.

Suddenly the globe burst, and we were enveloped in cascades of living fire.
The next thing I remembered I was stretched out on the burning sand, lying alongside my uncle. The violent storm had smashed our raft on the rocks, throwing us into the boiling sea.

It was only fearless Hans who had saved us from certain death.

I could see him now, salvaging our supplies from the wreck and lining them up on the sand.

Thanks to his superhuman efforts most had been saved, including all our precious instruments. But where were we now?

I turned to my uncle.

'My calculations show we must be 2,500 miles from Reykjavik and now under the Mediterranean,' I said.

'Let us check,' said my uncle, reaching for the compass. He looked at it in disbelief, shook it and looked at it again.

Then he stared at me in alarm, and passed it to me. The needle pointed north to where we expected would be south.

During the tempest a sudden change of wind must have brought the raft back to the shore it had left.
There was no mistaking the rage that was written on my uncle's face.
Never have I seen a man more crestfallen, and then so indignant.
It was as though all the dangers we had gone through had been for nothing.
The Professor shouted out his defiance.
"Fate is playing terrible tricks," he fumed. "But I will not yield. I shall not retreat an inch.
"We shall see who can triumph: man or nature!"
I tried to make him see reason.

"We cannot fight the impossible," I said. "We are ill-equipped for a sea voyage. We cannot again travel on this pile of beams, with just a blanket for a sail and a stick for a mast.
"It is madness for us to carry on."
But my uncle would not listen.
"Tomorrow we shall set sail again," he announced. "But as fate has cast us on these shores again we must at least devote a little time to examining them."
Leaving Hans working on the raft, we started off along the shore.
As we walked our feet crushed innumerable shells of every shape and size — once the homes of animals from every period of creation.

Here and there were the remains of every kind of prehistoric monster.

My uncle was in his element. His mouth was wide open, his eyes glinted behind his spectacles, his whole face displayed utter astonishment.

Then he cried: ‘Axel! A human!’

What we had found was a perfectly preserved human body.

Propped up against a rock, it seemed to watch us from its hollow eye sockets.

The Professor announced: ‘This is a fossil man, who was alive at the same time as the mastodons whose bones lie all around us here.

‘But how he or they got here from the Earth above us I have no clue.’

We continued our expedition but became more and more uneasy, wondering if any other strange creatures could still be wandering around near the shore of this giant sea.
Were other revelations waiting for us in this great cavern?

Ahead we could see an immense forest of giant conifers. But they lacked one thing — colour!

Deprived of the light of the sun, they appeared faded and brown.

We were about to see what surprises this forest might hold when I suddenly stopped. I held my uncle back.

As if in a dream we could see gigantic elephants moving through the foliage.

And we could hear the sound of their tusks uprooting whole trees.

My uncle seized my arm.

‘Come!’ he shouted. ‘Let us go closer.’

‘No!’ I replied. ‘We are unarmed. No human creature could face the anger of these monsters.’

‘No human creature?’ he said. ‘You are wrong. Look over there.’

Appearing from behind a tree was what was obviously a human being.

He was a giant of a man, over 12 feet tall with a head as big as a buffalo’s and a huge mane of matted hair. In his hand he clutched a massive branch.

‘Run for it!’ I shouted.
Speechless with shock, we began to return to where we had left the raft.

We were making our way over some rocks when I spotted something shining in the sand. I stooped to pick it up.

'That is it?' asked the Professor.

I showed him a rusty knife.

'It must be a weapon of some prehistoric warrior,' I said. 'But it can't be. It isn't from the Stone Age. Or even the Bronze Age. This is made of steel.'

My uncle stopped me short.

'Calm yourself,' he said. 'This knife is Spanish from the 16th century. Look at the rust. It has been lying here for one, two or three hundred years.

'See its jagged edges, as if it has been used to carve an inscription on the rocks.

'It is obvious someone must have been here before us!'

'But who?' I asked.

'A man who has written his name with this very dagger. A man who has tried once again to show the right road to the interior of the earth!'
We looked around. Then we noticed at the foot of the cliffs the entrance to a dark and gloomy tunnel.

And there, carved on a slab of granite, we could see two half-worn letters.

They were the two initials of the bold adventurer who had preceded us here!

'A.S.J.' cried my uncle. 'I was right! Arne Saknussemm has been here!'

Since we had started on our journey I had experienced many surprises, but none compared to the sight of those two letters, engraved 300 years before.

Now I could no longer doubt the existence of the learned traveller.

The Professor was impatient to continue in Saknussemm's footsteps and we started towards the dark tunnel.

'The horizontal sea was taking us nowhere,' he said.

'Now we shall continue to go down and down. We have less than 5,000 miles to travel!'

'But first go and find Hans and bring him here.'
We entered the tunnel and switched on our Ruhmkorff lamps. But we had not gone far before we were stopped by an enormous block of granite. In vain we tried to find a way round it, but our path was completely blocked.

We were bitterly disappointed. My uncle angrily paced up and down.

'What about Saknussem?' he asked.

'It's obvious,' I said, 'that this has happened since Saknussem returned to the surface. Perhaps this tunnel was the outlet for the pent-up lava in the interior of the earth, with the eruption flowing freely and carrying giant rocks along with it.

One day after an unusually strong shock, this rock fell and blocked the passage.'

'Hick axes!' cried my uncle. 'We'll force a way through!'

'No,' I replied, 'It is far too hard.'

'Then gunpowder!' he cried. 'We'll blow it up! Hans, to work!'

The Icelander placed the explosive and laid the fuse. Then we left the tunnel and took the raft out to the open sea, away from danger.

Sparks hissed and spluttered along the fuse. Seconds passed - then the whole world seemed to explode.
Journey to the Centre of the Earth

These are the three men who are in the story:

- Professor Otto Lidenbrock: a professor of philosophy, chemistry, geology, mineralogy and many other ologies.
- Axel: the Professor's nephew, who takes a great interest in his uncle's work.
- Hans Bjelke: an Icelander, who is very tall and strong and intelligent.

The story so far:

The story takes place in 1863 and begins with Axel and Professor Lidenbrock finding a small scrap of paper in an ancient book. The paper gives details of a secret route leading to the centre of the Earth. They discover that this journey has already been travelled by the person who left the scrap of paper in the book - a man called Arne Saknussemm. The Professor has heard of Arne Saknussemm before, and explains that he was a 16th Century scholar and traveller from Iceland.

Very excited by this discovery, the Professor decides that he and his nephew, Axel, should attempt their own journey to the centre of the Earth. The message on the paper directs them to an extinct volcano in Iceland, which is the entrance to the interior of the Earth. So they pack various gadgets, tools and weapons and travel to Iceland. Here they meet Hans Bjelke, who will be the guide on their journey.

Now a group of three, the Professor, Axel and Hans make their way to the extinct volcano and climb up it. They know that they have come to the right place because they find a mark left by Arne Saknussemm - his name carved on a giant rock. They begin their descent towards the interior of the Earth through the chimney of the extinct volcano. At the base of the chimney they find a system of tunnels sloping downwards, which marks the real entrance to the centre of the Earth.

As they travel downwards, the Professor, Axel and Hans pass through the different layers of the Earth's crust, shown by the various rocks making up the tunnels. They discover that the final layer is of granite, and is the layer on which all the others rest. They travel downwards for many weeks, and experience various adventures along the way. Eventually, they find themselves surrounded by granite, at a depth of more than 50 miles and a distance of more than 250 miles from their starting point ...
1. According to Axel's calculations, how long was it going to take to reach the centre of the earth at their present rate of descent?
   A. One hundred years
   B. Two days
   C. Five and a half years
   D. Ten years

2. Where was Axel when he woke up from being unconscious?
   A. At the bottom of a well
   B. In a charming grotto
   C. On top of a volcano
   D. At home in bed

3. How did Axel feel when he saw the inland sea?
   A. Happy
   B. Angry
   C. Sad
   D. Frightened

4. What did the Professor, Axel and Hans see when they went walking near the inland sea?
   A. Tiny mushrooms, plants and trees
   B. Giant mushrooms, plants and trees
   C. A fleet of boats
   D. Giant toadstools

5. The thigh-bone of which prehistoric animal was found by Axel, Hans and the Professor in the forest near the inland sea?
   A. A megatherium
   B. A woolly mammoth
   C. A dinotherium
   D. A brontosaurus
6. How many of the animal bones could Axel name?
   A. Three
   B. Five
   C. None
   D. Thirteen

7. What did Hans make the raft out of?
   A. Some planks of wood
   B. A giant seashell
   C. Some pieces of seaweed
   D. Fossilised tree trunks

8. What sort of marks did they find on the iron bar used to test the depth of the water?
   A. Claw marks
   B. Chalk marks
   C. Pencil marks
   D. Teeth marks

9. Which one of these giant animals did they notice in the middle of the inland sea?
   A. Lion
   B. Jellyfish
   C. Whale
   D. Crab

10. Which animal was killed in the underwater fight?
    A. A duck-billed platypus
    B. A plesiosaurus
    C. An ichthyosaurus
    D. A shark

APPENDIX 6.4: Multiple choice questions
11. In which month of 1863 did the storm happen?
   A. January  
   B. May  
   C. December  
   D. August

12. Which of the characters saved the other two from certain death in the storm?
   A. Hans  
   B. Axel  
   C. The Professor  
   D. Arne Saknussemm

13. How did Axel feel about setting sail again after the storm?
   A. He was frightened  
   B. He was very keen  
   C. He thought it was not a good idea  
   D. He didn't care

14. After the storm, Axel and the Professor found a complete skeleton of what?
   A. A human  
   B. A cat  
   C. A dog  
   D. A mastodon

15. What sort of trees from the immense forest were described as being without colour because they were getting no sunlight at the centre of the Earth?
   A. Oak trees  
   B. Conifer trees  
   C. Silver birch trees  
   D. Willow trees

APPENDIX 6.4: Multiple choice questions
16. How tall was the giant man seen by Axel and the Professor in the forest of giant trees?

A. One hundred feet tall
B. Five feet tall
C. One inch tall
D. Over 12 feet tall

17. What sort of knife did Axel find on the rocks near where the raft was wrecked?

A. A sharp knife
B. A rusty knife
C. A shiny knife
D. A broken knife

18. Which letters did Axel and the Professor find carved near the rocks where the raft was wrecked?

A. "P.L." - for Professor Lidenbrock
B. "H.B." - for Hans Bjelke
C. "R.D." - for Roald Dahl
D. "A.S." - for Arne Saknussemm

19. What blocked the way in the tunnel?

A. A large block of granite
B. An elephant
C. A huge locked door
D. A brick wall

20. What did Hans use to remove the blockage in the tunnel?

A. A pickaxe
B. His bare hands
C. Gunpowder
D. A battering ram

APPENDIX 6.4: Multiple choice questions
<table>
<thead>
<tr>
<th>Story order</th>
<th>Random</th>
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<tbody>
<tr>
<td>1</td>
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<td>19</td>
<td>16</td>
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<tr>
<td>20</td>
<td>6</td>
</tr>
</tbody>
</table>

APPENDIX 6.5: Order of multiple choice questions
Personal details:

Name: 

Date of birth: 

Age: 

Gender: 

BEFORE READING:

Previous experience of chosen text:

1. Have you ever read the book *Journey to the Centre of the Earth*?
   Yes ☐ No ☐ Not sure ☐

2. Have you ever seen a film of *Journey to the Centre of the Earth*?
   Yes ☐ No ☐ Not sure ☐

Reading habits:

3. Do you like reading?
   Yes ☐ No ☐ Not sure ☐

4. How often do you read stories at home?
   Very often ☐
   Often ☐
   Sometimes ☐
   Hardly ever ☐
   Never ☐

Roald Dahl ☐
Goosebumps ☐
5. How often do you read stories at school?

Very often □
Often □
Sometimes □
Hardly ever □
Never □

6. Do you borrow books from the local library?

Yes □ No □

7. Which of these do you read most often? Which do you read least often?

Story books □
Stories on tape □
Comics □

8. What book(s) are you reading at the moment?


Computer experience:

9. Do you have use of a computer at home?

Yes □ No □

If Yes:
9a. What sort of computer?


9b. How often do you use the computer at home?

Very often □
Often □
Sometimes □
Hardly ever □
Never □

APPENDIX 6.6
10. How often do you use the computer at school?

Very often
Often
Sometimes
Hardly ever
Never

Experience of electronic books:

11. Have you ever seen or read a book on a computer?

Yes [ ] No [ ] Not sure [ ]

11a. If Yes:
How often do you read books on a computer?

Very often
Often
Sometimes
Hardly ever
Never

11b. If Yes:
What sort of book(s) have you read on the computer?

Story books
Poetry/rhymes
Books of facts and information
Other

AFTER READING:

Did you like the book?

Yes [ ] No [ ]

Would you like to read the rest of the book?

Yes [ ] No [ ]

APPENDIX 6.6
Demonstration of an Electronic (CD-ROM) Version of *Peter Pan*

The CD-ROM was inserted into the computer and the book was opened by clicking on the appropriate icon. The first screen which was seen depicted a bookshelf (Figure 6.7.1), and then an animated book was seen coming out of the shelf (Figures 6.7.2 and 6.7.3). The animated book opened to reveal a map (Figure 6.7.4). It was then explained to the participant that this map was the contents list of the book, and that it was possible to access the different chapters using either the list situated to the right of the screen, or the numbered teddy bears depicted in the map taking up the major part of the screen (Figure 6.7.4). The book shaped menus at the top right of the screen (“About the Author”, “About this book” and “Quit”) were explained. The book was then set in motion starting at Chapter 1. A short animation depicting Peter Pan flying through the air was seen (Figure 6.7.5). The first page of the book was then permitted to run without interruption, so that the participant could see the animation and narration (Figure 6.7.6). At the end of the narration of the first page (screen), a mouse appeared and exclaimed “Why don’t you click on me?” (Figure 6.7.7). The experimenter then clicked on the mouse as requested, and participants were able to observe the response of the mouse, which was to laugh and say “It tickles”. The experimenter then explained that there were more features of this sort (“hot spots”) included within the book, and showed further examples on the page. These involved clicking on the flowers at the left hand side of the page and causing them to bloom (Figure 6.7.8), and clicking on the upstairs window of the house and causing a dog to appear (Figure 6.7.9).

The book-shaped menus (“Read it again” and “Go to map”) at the top right of the screen were explained. Participants were then shown how to proceed on to the next page of the book by mouse clicking on the word “Click” situated at the lower right corner of the page. The computer narration began again, but after the first paragraph, the experimenter stopped the narration by clicking on the picture of the rope pull depicted at the upper right corner of the page (Figure 6.7.10). This was done in order to show that it was possible, and to demonstrate that the hot spots would still be working if the narration had been stopped. The experimenter illustrated this fact by clicking on the tree to the left of the picture and getting a face depicted within it (Figure 6.7.11).

The hypertext links, that is, those words highlighted in green were explained and demonstrated (Figure 6.7.12). Participants were then shown how to return to the map contents, and given five minutes in which to familiarise themselves with the electronic book. After this time, the experimenter removed the CD-ROM from the machine and asked the participant to read the summary of the story so far (see Appendix 6.3).

APPENDIX 6.7
Figure 6.7.1: Bookshelf. *Peter Pan* (Barrie 1902), pub. Europress Software 1997

Figure 6.7.2: Book appears from shelf. *Peter Pan* (Barrie 1902), pub. Europress Software 1997
Figure 6.7.3: Book appears from shelf. *Peter Pan* (Barrie (1902), pub. Europress Software 1997)

Figure 6.7.4: Map (contents) page. *Peter Pan* (Barrie (1902), pub. Europress Software 1997)
All children, except one, grow up.
They soon know that they will grow up.
This is how Wendy Darling found out.

She was playing one day in the garden of Number 14, where she lived with her mother and father and her brothers John and Michael.

Wendy plucked a flower and ran to her mother with it. She looked so delightful that Mrs Darling put her hand to her heart and cried: "Oh, why can't you stay like this forever?"
From then on, Wendy knew she was going to grow up.
All children, except one, grow up. They soon know that they will grow up. This is how Wendy Darling found out. She was playing one day in the garden of Number 16, where she lived with her mother and brothers John and Michael. Wendy plucked a flower and ran to her mother with it. She looked so delightful that Mrs. Darling put her hand to her heart and cried: "Oh, why can't you stay like this forever?"

From then on, Wendy knew she was going to grow up.
Figure 6.7.9: Interactive dog. *Peter Pan* (Barrie (1902), pub. Europress Software 1997)

All children, except one, grow up. They soon know that they will grow up. This is how they grow up.

Wendy. Darlings find out. She was playing one day in the garden of Number 14, she lived with her mother and father and her brothers John and Michael.

Wendy plucked a flower and ran to her mother with it. She looked so delighted that Mrs Darling put her hand to her heart and cried: "Oh, why can't you stay like this forever?"

From then on, Wendy knew she was going to grow up.

Figure 6.7.10: Narration stopped. *Peter Pan* (Barrie (1902), pub. Europress Software 1997)

Nana.

She had belonged to no one in particular until the Darlings engaged her.

Nana had always thought children important, and proved to be quite a treasure of a nurse.

Even her kennel was in the nursery.

It was a joy to see her escorting the children to school.

She would walk sedately by their side when they were well behaved, butting them back into line if they strayed.

Usually she would be carrying an umbrella in her mouth in case of rain.

The children loved her, and would do anything for her.

There never was a happier family until the coming of Peter Pan.
Figure 6.7.11: Interactive tree. *Peter Pan* (Barrie 1902), pub. Europress Software 1997

Figure 6.7.12: Example of hypertext. *Peter Pan* (Barrie 1902), pub. Europress Software 1997
ELECTRONIC BOOK QUESTIONNAIRE

1. Which of the following would you consider to be an "electronic book"? (Please tick ALL which apply)
   - An audio or talking book
   - A text available over the Internet
   - A multimedia book available over the Internet
   - A multimedia book on CD-ROM accessible only via a hand-held computer
   - A multimedia CD-ROM book accessible via a desktop computer
   - A multimedia book on computer disk accessible only via a hand-held computer
   - A multimedia book on computer disk accessible via a desktop computer
   - A pocket calculator sized reference book, e.g. language dictionary

Note: There is no general consensus on a definition of the term "electronic book". It is therefore felt necessary, for the purpose of consistency in this research, to select one of the above for reference. The model accepted by most publishers is that of a multimedia CD-ROM book accessible via a desktop computer. As a result, for the remainder of the questionnaire, please consider the term "electronic book" to mean a multimedia CD-ROM book accessible via a desktop computer, e.g. Microsoft Art Gallery, The Way Things Work (Dorling Kindersley), Just Grandma and Me (Living Books), etc.

2. Do you currently stock electronic books in any of the libraries under your jurisdiction?  
   - Yes  
   - No

   If “No”, please go to Question 16.

3. In which sorts of library do you stock electronic books? (Please tick ALL which apply)
   - Main library/libraries
   - Branch/community libraries

APPENDIX 7.1: Library study questionnaire
4. For which purpose(s) do your libraries stock electronic books? *(Please tick ONE box only)*

- For reference only, i.e. within the library  
- For loan only  
- For reference within the library and for loan

If you stock electronic books for loan, is this service provided by the commercial organisation called Ramesis?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
</table>

5. Which of the following types of electronic book for children do your libraries currently offer? *(Please tick ALL which apply)*

For reference only | For loan  
---|---
- Story books  
- Reference books  
- Text books  
- Literature, i.e. poetry, prose and drama  
- Special interest books, e.g. hobbies  
- Other (please specify) 

6. How popular are the electronic books for children which your libraries offer? *(Please tick ONE box only in each case)*

For reference only | For loan  
---|---
- More popular than the printed version  
- Less popular than the printed version  
- About the same popularity as the printed version

7. Do you think young borrowers should pay to use electronic books provided by a library?

For reference only | For loan  
---|---
- Yes  
- No  
- Not sure

8. Which of the following statements best sums up your opinion with regard to the effect of stocking electronic books on membership of children's libraries? *(Please tick ONE box only)*

- Stocking electronic books generates new members  
- Stocking electronic books makes no difference to membership  
- Stocking electronic books discourages new members
9. Who do you think should be primarily responsible for selecting electronic books for children for libraries? (Please tick ONE box only)

- The senior manager with responsibility for work with children
- The local children's specialist
- The local generalist Librarian
- The senior manager with responsibility for IT
- The local IT Manager
- The senior manager with responsibility for stock acquisition
- A team of qualified librarians specialising in children's services
- Other person (please specify)

10. How important do you consider the following criteria for selecting electronic books for children for a library? (Please tick the box that best sums up your opinion in each case)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Not important</th>
<th>Important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
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<tr>
<td>Added features offered by the electronic medium, e.g. animation, sound, etc.</td>
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<td>Author reputation</td>
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<tr>
<td>Best-selling title</td>
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<tr>
<td>Content, i.e. subject matter/story</td>
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<tr>
<td>Coverage of National Curriculum subject areas</td>
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<tr>
<td>Ease and reliability of loading and installing</td>
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<tr>
<td>Ease of use by readers</td>
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<tr>
<td>Popularity of printed version within the library</td>
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<tr>
<td>Price</td>
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<tr>
<td>Publication date (for up-to-date information)</td>
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<tr>
<td>Quality of illustrations</td>
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<tr>
<td>Quality of language - text and spoken</td>
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<tr>
<td>Recently adapted for television, cinema or video</td>
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<tr>
<td>Relationship between language and illustrations</td>
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<tr>
<td>Suitability of content for intended age group</td>
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<tr>
<td>Television/film novelisation</td>
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<tr>
<td>Title is regarded as a classic in printed version</td>
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<tr>
<td>Well-known title</td>
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<tr>
<td>Other criteria not listed above - please give details</td>
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</table>

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11. Do you think it is important that the person/people selecting children's electronic books for libraries should be able to see the products before making a choice?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
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</table>

12. Have you experienced additional security problems when stocking electronic books, as compared to just printed books?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
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If "Yes", please give further details below

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13. For which purpose(s) do you think electronic books for children should ideally be kept by libraries? (Please tick ONE box only)

- For use within the library only
- For loan only
- For use within the library and for loan
- None of the above

14. Which of the following measures have you found necessary in order to offer young borrowers access to electronic books? (Please tick ALL which apply)

- The purchase of additional equipment
- Training yourself and your staff
- Making space for dedicated equipment
- Spending extra time with readers

15. What do you consider to be the best way to display electronic books for children within a library? (Please tick ONE box only)

- In a separate section of their own
- With printed books of a similar type, e.g. fiction
- With audio/talking books
- As icons on a screen to access pre-loaded software
- Near to computers with CD-ROM players
- Other (please specify)
GENERAL VIEWS ON ELECTRONIC BOOKS

Below is a list of statements regarding electronic books. Please tick the box that corresponds to your level of agreement/disagreement with each statement.

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>Disagree</th>
<th>Neither agree nor disagree</th>
<th>Agree</th>
<th>Agree strongly</th>
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<tr>
<td>16. I believe that electronic books are a fad that will eventually disappear</td>
<td></td>
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<tr>
<td>17. I believe that electronic books have the ability to exist alongside printed books</td>
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<tr>
<td>18. I believe that electronic books will eventually supersede printed books</td>
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<tr>
<td>19. I consider electronic books to be insignificant with regard to the future survival of the library</td>
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<tr>
<td>20. I regard electronic books as a valuable complement to the printed items in a library</td>
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<tr>
<td>21. I think that libraries are being pushed by cultural developments into providing electronic books</td>
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<tr>
<td>22. I believe that electronic books reinforce the importance of the librarian's role as an intermediary</td>
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<tr>
<td>23. I think that electronic books in libraries lead to a greater need for librarians to learn new technology</td>
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<tr>
<td>24. I believe stocking electronic books increases the amount of administration in a library</td>
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<td>25. I think that electronic reference books require more advanced search skills than printed ones</td>
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<td>26. I think that reluctant readers are encouraged to read printed books through electronic books</td>
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<td>27. I believe that a different type of young reader from usual is attracted by electronic books</td>
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<td>28. I think that the majority of children rely on the library for experience of electronic books</td>
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29. To which of the following types of electronic book do you have access in your home? *(Please tick ALL which apply)*

- Electronic books designed for children
- Electronic books designed for adults
- Electronic books designed for both children and adults
- Other (please specify)
  ...........................................................................................................................
- None of the above

30. It is felt that people of different ages and sexes are likely to have differing views on electronic books. To help assess this, please tick the relevant box in each case.

<table>
<thead>
<tr>
<th>Age</th>
<th>18-25</th>
<th>26-35</th>
<th>36-45</th>
<th>46-55</th>
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<tr>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
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31. Do you have any other comments? *(Please use the space below)*

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ELECTRONIC BOOK QUESTIONNAIRE

This questionnaire is part of a research project investigating the subject of electronic books. It is felt very important to gauge the opinions on this subject of booksellers in smaller book shops, as major stakeholders in the field of publishing. To this end, your views on this new technology are sought and would be very welcome, so please take time to fill in the questionnaire. Any answers given will be treated in strict confidence. A reply paid envelope is enclosed for your response. Please return your completed questionnaire to Sally Maynard by Monday 23rd September 1996.

ELECTRONIC BOOKS

1. Which of the following would you consider to be an "electronic book"? (please tick all those which apply)

   - An audio or talking book
   - Text available over the Internet
   - Multimedia book available over the Internet
   - Multimedia book on CD-ROM accessible only via a hand-held computer
   - Multimedia CD-ROM book accessible via a desktop computer
   - Multimedia book on computer disk accessible only via a hand-held computer
   - Multimedia book on computer disk accessible via a desktop computer
   - Pocket calculator sized reference book, e.g. language dictionary

   Note: There is no general consensus on a definition of the term "electronic book". It is therefore felt necessary, for the purpose of consistency in this research, to select one of the above for reference. The model accepted by most publishers is that of a multimedia CD-ROM book accessible via a desktop computer. As a result, for the remainder of the questionnaire, please consider the term "electronic book" to mean a multimedia CD-ROM book accessible via a desktop computer.

2. Which of these best sums up your present position with regard to electronic books? (please tick ONE box only)

   - Already selling electronic books
   - Definitely intending to stock electronic books
   - Considering stocking electronic books
   - Have not yet considered stocking electronic books
   - Definitely opposed to stocking electronic books

   Note: If you are definitely opposed to stocking electronic books, please go to question 6

APPENDIX 7.2: Bookseller questionnaire
3. Which of the following types of electronic book do you EITHER currently sell, OR are likely to offer in the future if you decide to stock electronic products? (please tick all those which apply)

<table>
<thead>
<tr>
<th>Currently sell</th>
<th>Likely to sell in future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children's books</td>
<td>□</td>
</tr>
<tr>
<td>Reference books</td>
<td>□</td>
</tr>
<tr>
<td>Text books</td>
<td>□</td>
</tr>
<tr>
<td>Literature, i.e. poetry, prose and drama</td>
<td>□</td>
</tr>
<tr>
<td>Special interest books, e.g. cookery</td>
<td>□</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>□</td>
</tr>
</tbody>
</table>

DEMONSTRATING ELECTRONIC BOOKS

4. Which of the following do you EITHER currently do, OR would be willing to do, in order to demonstrate electronic books to customers? (please tick all those which apply)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase additional equipment</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Train yourself and your staff</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Make space for dedicated equipment</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Spend extra time with customers</td>
<td>□</td>
<td>□</td>
<td>□</td>
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</tbody>
</table>

DISPLAYING ELECTRONIC BOOKS

5. Do you already, OR would you be willing to, stock products for different platforms, i.e. IBM compatible computers and Apple Macintosh?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
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<tbody>
<tr>
<td>Already stock products for different platforms</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Willing to stock products for different platforms</td>
<td>□</td>
<td>□</td>
<td>□</td>
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</table>

6. What do you consider to be the best way to display electronic books within the book shop? (please tick ONE box only)

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<tr>
<td>In a separate section of their own</td>
<td>□</td>
</tr>
<tr>
<td>With printed books of a similar type, e.g. classics, reference, etc.</td>
<td>□</td>
</tr>
<tr>
<td>With audio books</td>
<td>□</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>□</td>
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SECURITY ISSUES

7. Would you expect to experience additional security problems (e.g. shoplifting) when stocking electronic books, as opposed to when stocking printed books?

Yes ☐ No ☐ Not sure ☐

If "Yes", please give further details below
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BUSINESS CONCERNS

8. Would/has the requirement to charge Value Added Tax (VAT) influence(d) your decision to stock electronic books?

Yes ☐ No ☐ Not sure ☐

9. With regard to selling electronic books, would you consider either computer games shops or electronic retailers as your competitors?

Computer games shops Yes ☐ No ☐ Not sure ☐
Electronic retailers ☐ ☐ ☐

10. How much do you think customers would be willing to pay for an electronic children's storybook? (please tick ONE box only)

£0 - £10 ☐
£10 - £15 ☐
£16 - £20 ☐
£21 - £25 ☐
£26 - £30 ☐
£31 - £35 ☐
£36 - £40 ☐
£41 and above ☐
**YOUR VIEWS ON ELECTRONIC BOOKS**

There now follows a list of statements regarding electronic books. Please tick the box that corresponds to your level of agreement/disagreement with each statement.

<table>
<thead>
<tr>
<th></th>
<th>Disagree strongly</th>
<th>Disagree</th>
<th>Neither agree nor disagree</th>
<th>Agree</th>
<th>Agree strongly</th>
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<tr>
<td>11. I believe that electronic books are a fad that will eventually disappear</td>
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<td>12. I believe that electronic books have the ability to exist alongside printed books</td>
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<td>13. I believe that electronic books will eventually supersede printed books</td>
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<td>14. I consider electronic books to be insignificant with regard to the future survival of my book shop</td>
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<td>15. I regard electronic books as a valuable complement to the printed items in a book shop</td>
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<td>16. I feel pressured against my wishes by larger booksellers into selling electronic books</td>
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It is felt that people of different ages and sexes are likely to have differing views on electronic books. To help assess this, please tick the relevant box with regard to your age range and gender.

<table>
<thead>
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<th>Age:</th>
<th>18-25</th>
<th>26-35</th>
<th>36-45</th>
<th>46-55</th>
<th>56-65</th>
<th>66 and above</th>
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<table>
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<th>Gender:</th>
<th>Male</th>
<th>Female</th>
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Do you have any other comments? (please use the space below)

Thank you very much for taking the time to complete this questionnaire. Please now return it to Sally Maynard in the stamped addressed envelope provided.
28th April 1998

Dear <name>

Re: Electronic Book Questionnaire

The enclosed questionnaire is part of a research project investigating the subject of electronic books. The main aims of the project are to study the relationship between the printed and electronic book, to explore issues relating to readers and publishing, and to investigate the current and future role of electronic books within children's libraries.

The market for this significant new medium is developing quickly, particularly in the field of children's books, and libraries are becoming increasingly involved. It is therefore considered that children's librarians have a major and increasing part to play in this new technology. As a result, it is thought to be extremely important to gauge the opinions of children's librarians on this subject. To this end, your opinions and intentions regarding electronic books are sought and are considered to be of great significance. In order to gather the opinions of a representative sample of children's librarians, it is essential to ensure the maximum response to the questionnaire, so please take time to fill it in. Any answers given will be treated in strict confidence.

A reply paid envelope is enclosed for your response. Please return your completed questionnaire to Sally Maynard by 22nd May 1998. If you would like a summary of the results of the study, please write your name and address on the completed questionnaire.

Yours sincerely

Sally Maynard
Department of Information and Library Studies

APPENDIX 7.3: Library study covering letter
9th June 1998

Dear

Re: Electronic Book Questionnaire

You should recently have received a questionnaire as part of a research project investigating the subject of electronic books. Because of the anonymous nature of the questionnaire, unless you requested a summary of the results of the study I cannot tell whether or not you have replied. Therefore, if you have already completed and returned the questionnaire, thank you very much for taking the time to do so, and please ignore the remainder of this letter.

The deadline given for the return of questionnaires was 22nd May 1998. Although this date has now passed, it is important to ensure the maximum response to the questionnaire, and to gather the opinions of the most representative sample of children's librarians as possible. I would be very grateful, therefore, if you would spend a few minutes completing and returning the questionnaire in the reply paid envelope previously provided if you have not already done so. Please reply by 1st July 1998. If you would like a summary of the results of the study, please write your name and address on the completed questionnaire.

Yours sincerely

Sally Maynard
30 September 1996

Dear

Re: Electronic Book Questionnaire

You should recently have received a questionnaire as part of a research project investigating the subject of electronic books. Because of the anonymous nature of the questionnaire, I cannot tell whether you have replied or not. Therefore, if you have already completed and returned the questionnaire, thank you very much for taking the time to do so, and please ignore the remainder of this letter.

The deadline given for the return of questionnaires was 23rd September 1996. Although this date has now passed, it is important to ensure the maximum response to the questionnaire, and to gather the opinions of the most representative sample of booksellers as possible. I would therefore ask you once again, if you have not yet done so, please to spend a few minutes completing and returning the questionnaire in the reply paid envelope previously provided.

Yours sincerely

Sally Maynard

APPENDIX 7.5: Book shop study follow up letter
APPENDIX 6.2:
Journey to the Centre of the Earth – printed book version
An extract from

Journey to the Centre of the Earth

by

JULES VERNE

GLYPHA BOOKS
LOST!

For weeks we travelled deeper into the bowels of the earth. My own calculations had shown that at the present rate of descent we should take about five and a half years to reach the centre of the earth!

Completely absorbed in my work as we went along, I was examining a piece of granite by means of the lamp when I suddenly realised I was completely alone.

Evidently I had become separated from my companions and had entered a different gallery.

My situation could be summed up in three awful words: Lost! Lost!! LOST!!!

In the middle of this anguish a new horror took possession of my soul. I dropped the lamp.

Then, as I wandered aimlessly around, the earth failed me. I found I was falling down a vertical gallery.

My head struck against a sharp rock and I lost consciousness. Death seemed about to claim me.
When I came to I saw my uncle and Hans looking down on me.

'He lives! He lives!' cried my uncle.

I had awoken in a charming grotto, adorned with magnificent stalagmites, glittering in all the colours of the rainbow.

The floor was a soft and silvery sand.

No lamps were needed. A bright light penetrated through a narrow opening in the wall of the grotto.

Then I heard a vague murmur, like waves breaking on a beach, and the whistling of a wind.

I thought I must be dreaming. Or perhaps we had returned to the surface of the Earth.

Then I heard my uncle speaking.

'It is indeed a miracle that you were not killed a thousand times over,' he said. 'But rest now, for tomorrow we must set sail.'

'Sail?' I cried, more bewildered than ever.

'Yes, indeed,' said my uncle. 'Tomorrow we must be ready to go on board.'

My uncle tried to restrain me, but I scrambled to my feet and rushed outside the grotto. What a surprise greeted me.
In my wildest imagination I would never have conjured up such a scene.

'The sea - the sea,' I cried.

A vast expanse of water spread before us, until it was lost in the distance.

The tremendous vault over our heads - the sky, so to speak - appeared to consist of clouds of swirling water vapours.

Electric currents created astonishing plays of light among them, reflected on the enormous cliffs that reared up on all sides.

But for me the effect was sad and melancholy. For I realised that far above those clouds there must be a heavy roof of granite, weighing down on us.
After being imprisoned underground for 47 days, it was a delight to breathe the salt-sea air.

'Well,' said my uncle. 'Do you feel strong enough to go for a stroll?'

'Certainly,' was my ready answer. 'Nothing would give me greater pleasure.'

In the distance I saw a strange forest. It consisted of straight trunks with tufted tops, like sunshades.

'It's a forest of mushrooms!' cried my uncle.

He was right! There were thousands of them, growing up to 40 feet in height.

New wonders were everywhere. Around us were other groups of trees, like those on Mother Earth, but of phenomenal size.

There were flowing ferns as tall as pines, and gigantic grasses.

'Astonishing! Magnificent! Splendid!' cried my uncle.

'Here we have humble garden plants which became trees in the first centuries of the Earth.

'Look around you. No botanist ever before gazed on such a sight!'

'It is like a mighty hot-house, my boy - but let us remember it could also be a vast menagerie ...
'Look what we are standing on - these are the bones of prehistoric animals.'

I looked at the bones that lay scattered around. They resembled dried-up tree trunks. I could even name some of them.

'Here is the lower jaw-bone of a mastodon,' I said. 'The molars of a dinotherium - and the thigh-bone of the biggest of them all, the megatherium.

'But how could such beasts come to be in this granite cavern?'

'There is a simple answer,' replied the Professor.

'At one time the Earth consisted only of an elastic crust, subject to alternate upward and downward movement due to the law of gravity.

'And there must have been landslides, with large portions of sedimentary soil being cast into huge and mighty chasms.'

'That's possible,' I remarked. 'But if prehistoric animals lived down here, it is likely one of those monsters may now be lurking behind one of those steep rocks.'

'Then we have no time to lose,' cried my uncle. 'We must set sail tomorrow.'
The next morning we set off in search of more adventures.

Hans had managed to make a raft out of fossilised tree trunks he had found. It was about ten feet long and five feet wide, bound together with stout ropes.

With us we carried our instruments, luggage, food and a generous supply of water from a nearby stream.

Hans had made a rudder, mast and sail allowing us to guide the raft with ease.

The trouble was we were no longer going down, but sailing to the unknown.

The Professor grumbled: 'This voyage on a raft over a pond annoys me. We are not progressing with our discoveries.'

Often we tried the depth of the water, using an iron bar attached to a long rope. One day we had great difficulty reeling it in. We soon found out why.

On it were deep marks, as though it had been crushed between two hard objects.

'They are the marks of teeth!' I cried.

And I wondered what jaws must the owner of such molars be possessed of!

Suddenly, Hans pointed to where, about 200 yards away, a huge black mass was moving up and down.

My worst fears were realised.

'It is a colossal monster!' I cried in terror.
'Look!' observed the Professor in some agitation. 'It's a huge sea lizard of terrible size and shape. And there's also a giant crocodile. See his great jaws and rows of monstrous teeth. And a whale! A whale! Look at that enormous tail.'

Two hideous monsters spotted us and advanced towards the raft. I picked up my rifle in desperation, though I knew it could have had little effect against them.

Then they made a rush at one another.

My uncle coolly watched their gigantic struggle through his telescope.

'I thought so!' he cried. 'One is that most fearful of all prehistoric reptiles, the Ichthyosaurus.'

'And the other?' I asked.

'A serpent, concealed under the hard shell of a turtle - the Plesiosaurus.'

They attacked one another with tremendous fury. Such a giant combat had never before been seen by mortal eye.
The battle went on for hours. We crouched on the raft, weapons pointed towards them, and determined not to perish without a struggle.

Suddenly, the creatures disappeared beneath the waves. Several minutes went by in silence. Was this combat to end in the ocean depths?

Then an enormous mass rose out of the water. It was the head of the great Plesiosaurus. The terrible creature had been mortally wounded.

I could see nothing of his enormous shell-like body. Only his serpent-like neck, which twisted and curled in the agony of death.

It struck the water like a gigantic whip, then wriggled like a worm cut in two.

Water spurted in all directions.

Then its violent movements slackened, and at last the body of the mighty snake stretched out across the now calm water.

Danger over for now, our voyage continued even further into the unknown.

Many days passed without further incidents. Our observations showed we had already travelled nearly 800 miles across this sea and that our position was exactly under England.

It was now August 21, and we could sense the calm weather we had been enjoying was about to change.
A distant sound of thunder became louder and louder, and suddenly we were in the midst of a wild and raging tempest.

It came from the most distant corners of the mighty cavern. It roared, it yelled, it shrieked with the glee of demons.

The raft rose and fell with the storm. It moved faster and faster before the wind. Would the storm never end?

We appeared doomed. The mast and sail were carried away. I saw them swept into the sky to a great height.

We were frozen in terror.

Then a ball of fire, half white, half blue, the size of a 10 inch bombshell, swooped towards us, darting here, there and everywhere with great rapidity.

It approached my uncle who fell to his knees to avoid it. Then it came towards me as I stood pale and shuddering in the dazzling light and heat.

It danced around my feet. They seemed to be riveted to the deck.

Instruments, tools, firearms all clanged together with an awful noise. I realised what had happened. The electric globe had magnetised all the iron on board.

Suddenly the globe burst, and we were enveloped in cascades of living fire.
The next thing I remembered I was stretched out on the burning sand, lying alongside my uncle. The violent storm had smashed our raft on the rocks, throwing us into the boiling sea.

It was only fearless Hans who had saved us from certain death.

I could see him now, salvaging our supplies from the wreck and lining them up on the sand.

Thanks to his superhuman efforts most had been saved, including all our precious instruments. But where were we now?

I turned to my uncle.

'My calculations show we must be 2,500 miles from Reykjavik and now under the Mediterranean,' I said.

'Let us check,' said my uncle, reaching for the compass. He looked at it in disbelief, shook it and looked at it again.

Then he stared at me in alarm, and passed it to me. The needle pointed north to where we expected would be south.

During the tempest a sudden change of wind must have brought the raft back to the shore it had left.
There was no mistaking the rage that was written on my uncle's face.

Never have I seen a man more crestfallen, and then so indignant.

It was as though all the dangers we had gone through had been for nothing.

The Professor shouted out his defiance.

'Fate is playing terrible tricks,' he fumed. 'But I will not yield. I shall not retreat an inch.

'We shall see who can triumph: man or nature!' I tried to make him see reason.

'We cannot fight the impossible,' I said. 'We are ill-equipped for a sea voyage. We cannot again travel on this pile of beams, with just a blanket for a sail and a stick for a mast.

'It is madness for us to carry on.'

But my uncle would not listen.

'Tomorrow we shall set sail again,' he announced. 'But as fate has cast us on these shores again we must at least devote a little time to examining them.'

Leaving Hans working on the raft, we started off along the shore.
As we walked our feet crushed innumerable shells of every shape and size - once the homes of animals from every period of creation.

Here and there were the remains of every kind of prehistoric monster.

My uncle was in his element. His mouth was wide open, his eyes glinted behind his spectacles, his whole face displayed utter astonishment.

Then he cried: 'Axel! A human!'

What we had found was a perfectly preserved human body.

Propped up against a rock, it seemed to watch us from its hollow eye sockets.

The Professor announced: 'This is a fossil man, who was alive at the same time as the mastodons whose bones lie all around us here.

'But how he or they got here from the Earth above us I have no clue.'

We continued our expedition but became more and more uneasy, wondering if any other strange creatures could still be wandering around near the shore of this giant sea.
AMONG THE ANCIENTS

Were other revelations waiting for us in this great cavern?
Ahead we could see an immense forest of giant conifers. But they lacked one thing - colour!
Deprived of the light of the sun, they appeared faded and brown.
We were about to see what surprises this forest might hold when I suddenly stopped. I held my uncle back.
As if in a dream we could see gigantic elephants moving through the foliage.
And we could hear the sound of their tusks uprooting whole trees.
My uncle seized my arm.
'Come!' he shouted, 'Let us go closer.'
'No!' I replied. 'We are unarmed. No human creature could face the anger of these monsters.
'No human creature?' he said. 'You are wrong. Look over there.'
Appearing from behind a tree was what was obviously a human being.
He was a giant of a man, over 12 feet tall with a head as big as a buffalo's and a huge mane of matted hair. In his hand he clutched a massive branch.
'Run for it!' I shouted.
Speechless with shock, we began to return to where we had left the raft.

We were making our way over some rocks when I spotted something shining in the sand. I stooped to pick it up.

'What is it?' asked the Professor.

I showed him a rusty knife.

'It must be a weapon of some prehistoric warrior,' I said. 'But it can't be. It isn't from the Stone Age. Or even the Bronze Age. This is made of steel!'

My uncle stopped me short.

'Calm yourself,' he said. 'This knife is Spanish from the 16th century. Look at the rust. It has been lying here for one, two or three hundred years.

'See its jagged edges, as if it has been used to carve an inscription on the rocks.

'It is obvious someone must have been here before us!'

'But who?' I asked.

'A man who has written his name with this very dagger. A man who has tried once again to show the right road to the interior of the earth!'
We looked around. Then we noticed at the foot of the cliffs the entrance to a dark and gloomy tunnel.

And there, carved on a slab of granite, we could see two half-worn letters.

They were the initials of the bold adventurer who had preceded us here!

'A.S.!' cried my uncle. 'I was right!' Arne Saknussemm has been here!

Since we had started our journey I had experienced many surprises, but none compared to the sight of those two letters, engraved 300 years before.

Now I could no longer doubt the existence of the learned traveller.

The Professor was impatient to continue in Saknussemm's footsteps and we started towards the dark tunnel.

'The horizontal sea was taking us nowhere,' he said.

'Now we shall continue to go down and down. We have less than 5,000 miles to travel!'

'But first go and find Hans and bring him here.'
We entered the tunnel and switched on our Ruhmkorff lamps. But we had not gone far before we were stopped by an enormous block of granite.

In vain we tried to find a way round it, but our path was completely blocked.

We were bitterly disappointed. My uncle angrily paced up and down.

'What about Saknussemm?' he asked.

'It's obvious,' I said, 'that this has happened since Saknussemm returned to the surface.

'Perhaps this tunnel was the outlet for the pent-up lava in the interior of the earth, with the eruption flowing freely and carrying giant rocks along with it.

'One day after an unusually strong shock, this rock fell and blocked the passage.'

'Pickaxes!' cried my uncle. 'We'll force a way through!'

'No,' I replied, 'It is far too hard.'

'Then gunpowder!' he cried, 'We'll blow it up! Hans, to work!' The Icelander placed the explosive and laid the fuse. Then we left the tunnel and took the raft out to the open sea, away from danger.

Sparks hissed and spluttered along the fuse.

Seconds passed - then the whole world seemed to explode.