

**EVALUATING THE USE OF THE CATCH UP CD ROM 2
IN A HOME ENVIRONMENT**

Wayne Holmes

Dissertation submitted to the University of Oxford
for the degree of M.Sc. in Educational Studies (e-Learning)

Trinity Term 2008

With thanks to Ann, Cate, Graham, Julie, Oliver, Rebecca, Sue and Tracey.

Particular thanks to Jacqui Worsley and my supervisor Dr Chris Davies.

CONTENTS

Abstract.....	iv
Figures and tables	v
CHAPTER ONE: Introduction	1
1.1 Context.....	2
1.2 The Catch Up CD ROM 2	2
1.3 Declaration of interest.....	4
1.4 Parents.....	4
1.5 Research questions.....	5
CHAPTER TWO: Review of the field	8
2.1 Introduction.....	8
2.2 Learning	9
2.3 Struggling to learn to read	14
2.4 Learning in the home	16
2.5 Computers in the home	18
2.6 Computer games	21
CHAPTER THREE: Research design	27
3.1 Theoretical perspective	28
3.2 Research paradigm.....	30
3.3 Methodology	31
3.4 Research method.....	32
3.5 Sampling	34
3.6 Research ethics	36
3.7 Data analysis	37
3.8 Evaluation	40
3.9 The study.....	41

CHAPTER FOUR: Description of the data.....	43
4.1 The context and participants	
4.1.1 Geographic, socio-economic, and educational context	43
4.1.2 Oliver.....	44
4.1.3 Cate.....	44
4.1.4 Lewis	45
4.1.5 Ben.....	46
4.1.6 Laura.....	47
4.1.7 Joe.....	48
4.1.8 Jacqui Worsley	49
4.2 Using the Catch Up CD ROM 2	
4.2.1 Oliver.....	51
4.2.2 Cate.....	52
4.2.3 Lewis	53
4.2.4 Ben.....	55
4.2.5 Laura.....	56
4.2.6 Joe.....	56
4.2.7 Tabular summary of interview data.....	58
 CHAPTER FIVE: Analysis	 59
5.1 Introduction.....	59
5.2 How is the Catch Up CD ROM 2 used by parents?.....	62
5.3 What did the children gain from using CD ROM 2?.....	65
5.4 In what ways did the parents believe the Catch Up CD ROM 2 to be beneficial?	67
5.5 What might Catch Up do to ensure that, when used at home, CD ROM 2 effectively supports children’s literacy?	69
5.6 How might future digital games for learning be informed?	70
 CHAPTER SIX: Conclusions.....	 72
 References.....	 75
 Appendices.....	 84

ABSTRACT

This study evaluates how a set of digital games, developed for use in schools to complement an intervention for children who have reading difficulties, might be used at home, by parents to support their own children's literacy.

In the UK, significant numbers of children (6% of 11 year olds) have difficulties learning to read. Meanwhile, children who receive appropriate literacy support from their parents, it is widely acknowledged, do significantly better in literacy than those who do not. With this in mind, six children who have reading difficulties use the Catch Up CD ROM 2 (an interactive drill and practice resource designed for use in schools) for three weeks at home, under the supervision of their parents.

Mostly, the children enjoy playing the CD ROM and believe that it has enabled them to make some progress in their literacy abilities. The parents all valued the opportunity to participate in their child's learning and believe that the CD ROM's approach to learning is effective. Key influences on the successful use of the CD ROM are briefly considered, including: feedback, motivation, flow, metacognition, and zone of proximal development.

The study concludes, however, that whilst the CD ROM is itself broadly effective parents need better guidance to enable them to use it to its full potential – guidance which is both appropriate and accessible. The experiences of the children and their parents also raise a number of questions, further consideration of which might usefully inform the future development of effective digital games for learning.

FIGURES AND TABLES

Figure 1. Example frame from Catch Up CD ROM 2: <i>Raptor Attack (Land of the Dinosaurs)</i>	3
Figure 2. Example frame from Catch Up CD ROM 2: <i>The Sphinx (The Tomb of King Heb)</i>	3
Figure 3. The <i>Teacher's information screen</i> from Catch Up CD ROM 2	3
Table 1. Tabular summary of interview data	58

CHAPTER ONE

Introduction

*“I enjoy doing the CD at home more, because you haven’t got a lot of distractions and stuff.”*¹ (Joe, aged 10)

The Catch Up CD ROM 2 is an interactive CD ROM based computer programme designed to provide drill and practice support for children who struggle with literacy. It was developed by the charity Catch Up (1072425) for use in schools, where it is widely available (more than 3000 copies have been sold, Catch Up data) and well received (*“CD ROM 2 is very good, it has great potential.”* Jacqui Worsley, Norfolk Local Authority Computer Assisted Learning Coordinator).

In the UK, government research concludes that significant numbers of children have difficulties learning to read (Brooks, 2007). Meanwhile, other research (including Tizard *et al.*, 2002) suggests that ‘children who receive parental help are significantly better in reading attainment than comparable children who do not’ (*ibid.*: 55). With these findings in mind, this study sets out to evaluate how the Catch Up CD ROM 2 might be used at home, by parents to support their own children’s literacy.

¹ Throughout this dissertation, words italicised and within “double quotation marks” are direct quotations from transcribed interviews of the named source or of the family member under discussion.

1.1 CONTEXT

In the UK, very many children struggle with literacy (approximately 16% of children at age 7, and 6% of children at age 11 have reading difficulties that restrict their access to the National Curriculum – Brooks, 2007: 15). Brooks identifies a range of interventions, introduced by government agencies or developed independently, that aim to support these *struggling readers* – one of them being Catch Up Literacy: ‘there is a lot of evidence for its effectiveness’ (*ibid.*: 29).

Catch Up Literacy is delivered to children, in schools and other settings, by staff who have been trained by Catch Up (to date, more than 4000 staff across the UK). After being formatively assessed, the children receive a 15 minute structured individual teaching session, twice a week. Standardised data, reported by 23 local authorities across the UK, indicate that learners in Year Groups 2 – 6 who received Catch Up for an average period of 7.9 months made average Reading Age gains of 18 months (data supplied by Catch Up).

1.2 THE CATCH UP CD ROM 2

The Catch Up CD ROM 2 was developed, by Catch Up, to complement Catch Up Literacy (it is an additional resource, rather than a core component). It is, as the name indicates, Catch Up’s second interactive CD ROM.

CD ROM 2 comprises a structured series of reading, spelling and comprehension *drill and practice* exercises for children aged 6 to 11 at National Curriculum Reading Levels 2C-3C. There are 22 individual games, arranged in order of difficulty across five animated *worlds*: *Land of the Dinosaurs* (consonant clusters), *The Lost City* (short/long

vowel phonemes), *Planet Zizz* (high frequency words), *The Swamp* (comprehension), and *The Tomb of King Heb* (comprehension).



Raptor Attack (Land of the Dinosaurs)



The Sphinx (The Tomb of King Heb)

Figures 1 and 2. Example frames from Catch Up CD ROM 2

CD ROM 2 was designed for children to use whilst being supervised by a teacher or teaching assistant and for the games to be played ‘in the order in which they are presented, starting with *Land of the Dinosaurs*’ (Catch Up CD ROM 2 User Guide, 2003: 19, original emphasis) (it also includes hidden navigational facilities, via the ‘Teacher’s information screen’, to enable the supervising adult to ‘select any game in any order according to the child’s individual needs’ – *ibid.*). Achievement and progress are measured by the time it takes the player to complete a game, and the User Guide recommends players are encouraged ‘to try and beat their best times’ (*ibid.*: 16).

Charles Darwin			
	Best Time	Last Visited	Visits
G1	1:39	22/01/2003	2
G2	3:10	22/01/2003	1
G3	6:58	22/01/2003	1
G4	3:03	22/01/2003	1
G5	4:12	22/01/2003	1
G6	2:13	22/01/2003	2

Click to select world

The Lost City

Logbook Scores

World Chooser User Guide

Quit Continue

Figure 3. The *Teacher’s information screen*

By today's standards of interactive media (in the era of the *Nintendo Wii*, the *PS3* and the *X-Box 360*), CD ROM 2's games might appear neither exciting nor innovative (whilst the environments look three dimensional they are not open to exploration, and the games are based on a simple behaviourist approach to learning). Nevertheless, the anecdotal evidence (including feedback from schools, the distribution figures, and personal observation) is that they are very popular with the children for whom they were designed and with the teachers who use them to complement their teaching.

Catch Up's CD ROM 2 (rather than CD ROM 1) was selected for this study because the participating children were less likely to be familiar with it.

1.3 DECLARATION OF INTEREST

Before continuing, it should be noted that I work as a freelance consultant for Catch Up and produced (took responsibility for and managed the development of) the Catch Up CD ROM 2.

1.4 PARENTS

Almost all of the interventions identified by Brooks (2007), including Catch Up Literacy, are school based – yet there is 'a large body of evidence (that) demonstrates a strong and positive link between parents' involvement and interest in a child's learning and a child's subsequent adjustment and achievement' (Reynolds, 2005: 2, my parentheses; *cf.* also 'parental involvement has a significant effect on children's achievement', Desforges & Abouchar, 2003: 86; *cf.* also Tizard *et al.*, 2002; and Sylva *et al.*, 2008).

In addition, DCSF (Department for Children, Schools and Families) surveys consistently show that many parents would like to be more involved in their child's learning and/or wish to be more informed about their child's progress at school ('two in three parents agreed that they would like to be more involved in their child's school life' – Peters *et al.*, 2007: 35; *cf.* also 'many parents said they would like to know more about how they could in general support their child, or with homework' – Crozier, 1999: 322).

1.5 RESEARCH QUESTIONS

This study aims to bring together these two elements: an interactive CD ROM designed to support children's literacy in schools, and the link between a child's achievements and parental involvement. With this in mind, the research question becomes:

- Can the Catch Up CD ROM 2, an interactive CD ROM designed for use in schools, be used effectively by parents at home?

As in most studies, this highest order research question (which provides the framing and compass bearing for the study) suggests a number of secondary questions, here the emphasis being on what the children and parents *think* about their experiences, which more clearly reveal the full ambition of the study:

- How is the Catch Up CD ROM 2 used by parents? (In what ways do they supervise? How do they use the User Guide? Do they talk about the learning with their child?)

- What, if anything, do the children gain from using the CD ROM 2? (Are they engaged by it? Do they think they learned anything? Do they think there is any benefit from using the CD ROM at home, rather than at school?)
- In what ways, if at all, do the parents believe using the CD ROM 2 to be beneficial? (How did the CD ROM fit into family life? What do they believe their child gained, if anything, from the CD ROM? Is the drill and practice thought to be effective? What did parents gain, if anything, from their child's involvement with the CD ROM?)
- What might Catch Up do to ensure that, when used at home, CD ROM 2 effectively supports children's literacy? (Are any amendments necessary? Would any additional support or guidance be beneficial?)
- What might be learned that might usefully inform the development of future Catch Up (and other) electronic resources (to support struggling learners)?

In short, this study is essentially a modest formative evaluation that aims to address some real practical needs – to enable Catch Up to begin to support struggling readers outside the education system; to enable parents to support effectively (one aspect of) their children's learning; and to inform ways in which more effective e-learning resources for learners who struggle with reading might be developed: 'evaluations should be judged by their utility and actual use (...). Use concerns how real people in the real world apply evaluation findings' (Patton, 1996: 20).

It is also important at the outset to be clear about the limitations of the study, its boundaries, and to acknowledge what this study is *not*. Taking this latter requirement

first: research into computer use by children inevitably raises a complex range of other intriguing issues, such as: computer access (physical and financial); gender and ethnicity and computer use; computer addiction; and computer game violence. These issues, however, are beyond the scope of this particular study and will not be addressed. As for this study's boundaries: this is a qualitative investigation (in that it aims to illuminate and understand its subject rather than to provide statistical results) that looks at the use of a particular electronic resource by a small group of children and their parents (these issues, qualitative research, sampling and validity, will later be considered in more detail).

CHAPTER TWO

Review of the field

That which we call play they act at liberty (...); but what they are to learn is forc'd upon them, they are call'd, compell'd, and driven to it.

(Locke, 1692, section 75)

2.1 INTRODUCTION

This review is based upon: cascade searches derived from five published literature reviews (Desforges & Abouchaar, 2003; Sefton-Green, 2006; Kirriemuir & McFarlane, 2006; de Freitas, 2006; Egenfeldt-Nielsen, 2006); searches undertaken in the British Education Index, Educational Resources Information Center (ERIC) and SCOPUS databases (from 1998); Google Scholar, Google and Yahoo internet searches; and personal recommendations. Together, this has revealed an enormous body of research; this review, however, refers only to those publications found to be specifically helpful.

The core of this review comprises *learning in the home* and *the use of computer games to support learning*. Both of these, however, raise important questions about *learning in general*; while the content of the CD ROM 2 raises the issue of *struggling to learn to read*.

2.2 LEARNING

Learning is the process through which we become the human beings we are, the process by which we internalize the external world and through which we construct our experiences of that world. (Jarvis *et al.* 1998: viii)

Learning is a complex and extensive topic, with almost as many approaches and models as there are learning theorists. As such, here, the intention is to use a brief sketch of just one particular model, described by Greeno *et al.* (1996), to provide a context within which to place the particular learning that the Catch Up CD ROM 2 seeks to facilitate. Greeno *et al.* group learning theories (albeit with ‘relatively arbitrary boundaries’, *ibid.*: 16) according to trends that they identify in psychological research: empiricist (of which the *behaviourism* associated with Skinner, among others, is a key example), rationalist (*cognitivism* and *constructionism*, Piaget and Papert) and pragmatist-sociohistoric (*situative*, particularly Vygotsky).

Behaviourism focuses on the acquisition of knowledge and skills, it is the theoretical framework for much traditional teacher led classroom teaching (‘routines of activity’ comprising ‘clear goals, feedback and reinforcement’, *ibid.*: 27), and gives rise to the drill and practice approach to learning embodied in the Catch Up CD ROM 2 – providing opportunities for learners ‘to give responses of the kind that they are to learn and of feedback that is contingent on the individual student’s responses’ (*ibid.*: 21). Feedback is an essential component of effective drill and practice, to help ensure that the skills being learned become automatic and without error. At least in the context of multimedia, ‘children like drills because they are fun, interesting, exciting and not boring’, although the evidence is that drills can often ‘discourage cooperation and limit creativity’ (Luik, 2006: 56).

The behaviourist understanding of learning as the acquisition of (usually domain specific) knowledge and skills is challenged by the cognitivist emphasis on the understanding of concepts, reasoning and problem solving, applicable across domains. The intellectual development of children is often seen (after Piaget), as occurring in discrete – or at least identifiable, hierarchical and perhaps irregular – cognitive stages, such that learning happens when it is appropriate to the child’s current ability to conceptualise: ‘learning is seen as the process of adjusting our mental models to accommodate new experiences’ (Sefton-Green, 2006: 12). In the cognitivist model, there is still justification for drill and practice: ‘cognitive research has shown that through extensive practice, information becomes automated for the learner. Because individuals need to use very few cognitive resources on information that is “automatized,” they can thus focus on tasks that are more difficult’ (Goyne *et al.*, 2000: 347, original emphasis).

Cognitivism has also given rise to constructionism in which learners are understood to actively construct their own knowledge by direct engagement with the world around them. From this perspective, the traditional classroom is seen as ‘artificial’, and the teacher is redundant: learning should be achieved ‘as the child learns to talk, painlessly, successfully and without organized instruction’ (Papert, 1993: 9), a process made particularly possible through the affordances of the computer and other ‘objects to think with’ (*ibid.*: 11 and Turkle, 2005: 27). As games in education researchers Squires & Jenkins point out: ‘it is one thing for a teacher to lecture about scientific processes, another for students to learn about scientific processes and problem solving through experience’ (2003: 25).

Children's play is an essentially constructivist activity, the proto-natural form of learning: play is 'the paradigm of education as it represents the natural field of experience in which a child builds the basis of his/her whole knowledge' (Farné, 2005: 172). Vygotsky also identifies play as a fundamental corollary of learning: 'in play a child deals with things as having meaning' (1933). However, play is often characterised in opposition to learning – a common belief being that whilst learning can be fun, it mustn't be too much fun: most parents 'think of learning as "hard work" that can't (or shouldn't) be fun most of the time' (Prensky, 2006: 30, original emphasis and parenthesis). In fact, for many, learning is intrinsically playful or enjoyable 'the playful aspect of learning can be seen in the need/pleasure of exploring and knowing, in curiosity working as a propelling element, in the desire of doing and experiencing following the principle of trial and error' (Farné, 2005: 172), and hence teaching shouldn't need to be sugar-coated for learning to be effective.

Pure experiential or discovery learning, however, 'may fail to promote the first cognitive process, namely, selecting relevant incoming information. In short, when students have too much freedom, they may fail to come into contact with the to-be-learned material' (Mayer, 2004: 17). Equally, 'learners cannot learn without some overt information; they cannot discover everything for themselves' (Gee, 2003: 119). Teacher guided discovery learning, 'where the teacher is present to guide, advise, comment on progress, and offer explanations' (Laurillard, 1995: 184), and in which 'the learner is not compelled to follow a single narrative line originated by the teacher (as in the drill-and-practice packages), or alternatively to wander or experiment with possibilities of their own free will' (Buckingham, 2003: 124), offers a pragmatic synthesis. Guided discovery learning involves collaboration and dialogue between teacher (...) and learner.

It depends on the agreement of a shared goal, and the supply of guidance and feedback from teacher to student' (*ibid.*).

The third group of learning theories identified by Greeno *et al.*, *situated*, focus 'on the way knowledge is distributed in the world among individuals, the tools, artifacts and books that they use, and the communities and practices in which they participate' (1996: 20). Learning becomes an essentially social process (*cf.* Vygotsky, 1930), engaging in specific sets of shared practices and understandings of the world (particular 'semiotic domains' – Gee, 2003).

Situated learning also gives rise to the notion of authentic learning (*cf.* Galarneau, 2005), learning in the context of real-world problems that are directly relevant to the learner, rather than where there is little apparent connection to the world outside the classroom (such as with the type of mathematics teaching that involves only pages of calculations): 'learners cannot do much with lots of overt information that a teacher has explicitly told them outside the context of immersion in actual practice' (Gee, 2003: 119). If learning is authentic, learners are able to draw links between the material being learned and their pre-existing knowledge and, in particular, 'the use of authentic learning settings have the capability to motivate and encourage learner participation' (Herrington *et al.*, 2000).

In Vygotsky's social constructionism, learning is understood as occurring within the learner's zone of proximal development (ZPD). In this model, what a learner is able to do with assistance today (their actual development level) is distinguished from what they will be able to do by themselves tomorrow (their potential development level), the zone of proximal development being 'the distance between the actual developmental

level (...) and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers' (Vygotsky, 1930). In short, 'if there are no obstacles we don't learn much. If there are too many, we don't get anywhere, and give up' (Shaffer, 2006: 125).

There are two key consequences: that 'the only "good learning" is that which is in advance of development (Vygotsky, 1930, original emphasis); and that 'learning, and particularly the development of higher mental processes, requires a cooperative interaction between a student and a more learned other' (Ravenscroft, 2001:142): as in guided discovery learning, the central role of the teacher (adult guidance) is again restored.

Instead of *describing* how learning happens, as in the theoretical models outlined above, other researchers have considered how learning theory might most effectively be *applied* in real educational environments (*cf.* Ross, 2008). Black & Wiliam, for example, foreground formative assessment for learning (highlighting again, among other things, the critical importance of feedback (*cf.* also Vasilyeva *et al.*: 2007): 'tests (...) can be an invaluable guide to learning, but the exercises must be clear and relevant to learning aims. The feedback (...) should give each pupil guidance on how to improve, and each must be given opportunity and help to work at the improvement' (Black & Wiliam, 1998: 13) – feedback should be timely, constructive, and appropriate, and there should be immediate opportunity for the learner to act upon it.

Adey *et al.* (1998), on the other hand, have devised a series of cognitive acceleration programmes, which aim to improve children's ability to solve problems, structured around five pillars of developing thinking: concrete preparation ('making explicit links

to existing concepts and patterns of thinking’, Ross, 2008: 3), cognitive conflict (challenging the learner to engage with problems within their ZPD), social construction (most often, talking with others to construct together new patterns of thinking), metacognition (conscious reflection on the process of learning), and bridging (linking or transferring this learning to other experiences of learning). Throughout these two approaches, assessment for learning and cognitive acceleration, the role of the teacher is again highlighted, for example: ‘the role of adults as mediators of learning can be seen as the most effective way to encourage metacognition’ (Adey & Shayer, 1994: 68).

2.3 STRUGGLING TO LEARN TO READ

There is no doubt that reading comprehension is a complex process. To understand text, words need to be recognized and their meanings accessed, relevant background knowledge needs to be activated, and inferences must be generated as information is integrated during the course of reading. (Nation & Angell, 2006: 77)

Whilst learning to read might be complex, understanding how we learn to read is also often controversial. For more than 40 years, research in reading has seen a paradigm war – between those who insist that, for beginning readers, decoding is the primary route and those who argue for meaning (*cf.* Chall, 1976). However, Catch Up Literacy was developed not for *beginning readers* but for *struggling readers*, learners who have been learning to read for some years and have acquired some basic skills (such as a knowledge of letter sounds and an ability to read CVC words) but whose Reading Age is two or more years behind their Chronological Age: ‘Catch Up is for children who have been unable to make a significant start with reading in Reception and Year 1. It

builds upon the initial reading skills taught in the Early Years and gives children a fresh start with reading' (Catch Up, 2007a).

Nevertheless, a more technical understanding of what it means to be a struggling reader becomes possible if one conceptualises the process of learning to read in stages – stages 'that have a definite structure, that differ from each other in qualitative, characteristic ways, and that generally follow a hierarchic progression' (Chall, 1976: 14). Chall identifies six stages of learning to read, inspired by Piaget's stages of cognitive development, the first four being relevant here: the 'pre-reading stage' (ages 0 to 6 years), the 'initial reading or decoding stage' (6 to 7 years), the 'fluency' stage (7 to 8 years, using knowledge of decoding to access meaning), and the 'reading for learning' stage (9 to 12).

In this structure, the struggling reader might be thought of as one who is having difficulties negotiating the *initial reading or decoding* stage of learning to read, and as such they are unable to access meaning ('reading for meaning is greatly hindered when children are having too much trouble with word recognition' Stanovich, 2000: 393).

This is not to suggest that the teaching of reading must focus exclusively on decoding, the stages are not strictly hierarchical and decoding (word recognition) might best be learned within the context of meaning (language comprehension). Indeed, this is partly the approach taken by Catch Up Literacy, in the recognition that 'successful reading demands both word-level reading and the ability to comprehend what has been read' (Nation & Angell, 2006: 79).

A related issue for struggling readers is one of motivation: 'for struggling adolescent readers, motivation to engage with reading is critically important because they have

“failed” so often’ (Grisham & Wolsey, 2008: 96, original emphasis); ‘unrewarding early reading experiences lead to less involvement in reading related activities (...) and the negative spiral of cumulative disadvantage continues’ (Stanovich, 2000: 393). The problem is compounded when the learner is given something to read that is either too difficult or inappropriate for their age (often older struggling readers only have access to books that have been written for children many years younger). Instead, to help them break out of their spiral of disadvantage, to engage with reading, struggling readers ‘need texts which are appropriate to age and interest’ (that motivate) and ‘texts which are sufficiently challenging but not frustrating’ (that are in the individual learner’s ZPD) (Catch Up, 2007b: 6.1).

2.4 LEARNING IN THE HOME

Any interest in the role of ICTs in children’s learning forces the recognition that many children are immersed in ICT-related activities in their homes. (Sefton-Green, 2006: 5)

The family home is a complex, ill-defined space, of as many variations as there are families: structural variations (geographic, type, size, repair) multiply human variations (single parent families to extended families, only children to large families, socio-economic status to religious affiliation). It is a space in which the thrust and parry of family daily life is played out, in which parents and children live, eat, and play, whilst continuously negotiating roles and responsibilities.

In that, for example, it is an informal space, the family home is particularly distinct from school (the place where formal learning happens) – nevertheless, the home can be a significant site of learning. In fact, ‘much learning, perhaps most is at home’ (Hannon,

1995: 36), ‘the family is undoubtedly a significant – perhaps the *most* significant – location for children’s learning’ (Buckingham & Scanlon, 2003: 191, original emphasis) (*cf.* also, as mentioned earlier: Reynolds, 2005; Desforges & Abouchaar, 2003; and Tizard *et al.*, 2002).

In the traditional classroom, learning is often dictated by ‘the need for teachers to control learning outcomes, to maintain authority, to meet the demands of content laden syllabi, and at the same time moderate the behaviour of a large group of young people’ (Wellington, 2001: 236). In the home, however, learning often happens unintentionally, or is undertaken voluntarily for enjoyment, and it often leads to a wide range of unexpected learning outcomes that relate only obliquely to the school curriculum.

Not only *does* learning take place in the home (whether by family discussions, bedtime reading, help with homework, watching television, playing a game...), there is also lots of evidence that most parents want to be actively involved in their children’s education, that it ‘is empowering for parents to play a part in their child’s schooling, and to be fully informed and respected as partners’ (Oakley, 2005: 138; *cf.* also, as mentioned above: Reynolds, 2005; Williams *et al.* 2002; Peters *et al.* 2007). In fact, it might be said that, intentionally or otherwise ‘parents clearly do teach their children, even if they do not wish to be seen as teachers’ (Buckingham & Scanlon, 2003: 191). At the very least, parents can ‘help bridge the sociocultural gap between “home” literacies and “school” literacies, which can sometimes be a factor in reading difficulties (Oakley, 2005: 138, original emphasis); parents can (and often do) provide encouragement (whether accepted positively or not) and ‘parents play a critical role’ in nurturing motivation (Baker, 2003: 89) which, as has been mentioned, is an essential prerequisite for

cognitive and academic development. Parental attitudes also can have a significant impact: ‘parents who believe that reading is a source of entertainment have children with more positive views about reading than parents who emphasize the skills aspect of learning to read’ (*ibid.*: 101). Meanwhile, ‘parents with low income and less education tend to emphasize drill and practice of reading skills over more informal and playful opportunities for literacy learning’ (*ibid.*: 91).

As this suggests, it isn’t all straightforward: ‘parental involvement inevitably tends to favour ‘enthusiastic’ parents, who are confident in their relations with the school, and comfortable with seeing themselves as educators at home’ (Buckingham & Scanlon, 2003: 17). Other parents, despite wanting to be involved, often ‘find the barriers to doing so insurmountable’ (Reynolds, 2005: 15) – they recognise a need, but are unsure of their abilities, or of what kinds of support are most appropriate (Desforges & Abouchaar, 2003). Some parents turn to the school for advice; however, the evidence is that few teachers offer effective strategies (Comber *et al.*, 2002: 233). As for the home computer, often purchased to support children’s learning (Facer *et al.*, 2003: 20), the problem is particularly acute: ‘many parents feel unable to support their children in its use’ (DCSF, 2008).

2.5 COMPUTERS IN THE HOME

Whilst not (yet) ubiquitous, the computer is nevertheless a feature in most homes in the UK. Two years ago (according to the most recent government statistics: ONS, 2006), 67% of UK households owned a computer (dropping to less than a third of households in the lowest income group), and the trend is upwards (OFCOM, 2008). Despite these high percentages, and despite households with children being significantly more likely

to own a computer (DfES, 2002), ‘over one million children do not have (computer) technology (...) in their home’ (DCSF, 2008, my parenthesis), a situation that the government has signalled it aims to address (*ibid.*). On the other hand, approximately two thirds of young people do have access to a digital games console (households in the lowest income group are more likely to have a games console than a computer: OFCOM, 2008).

Compared with the situation in homes, young people still often only have limited experience of computers at school. Not only are there more computers in households than in school (writing in 2001, Wellington estimated that there were approximately six times as many), but also children’s access to computers in school is often restricted (in over three quarters of schools, computers are often locked up in computer labs and/or are available only at specified times: BECTA, 2007). It still seems that, ‘in school, computers are seen primarily as a resource for learning rather than a context for learning’ (Facer *et al.*, 2003: 232) – the emphasis is still on *learning how to use the computer* rather than on *using the computer to learn*.

Wellington (2001) summarises key differences in the way that computers are used in school and at home: (often) compulsory access at school/voluntary access at home; timetabled/when convenient; mostly collective/mostly individual; directed/un-directed; staged/haphazard; targeted/open ended; measurable learning outcomes/mostly unintended learning outcomes; and teacher control/learner (or parent) control. In particular, ‘the use of ICT at home (...) can provide the possibility of quality time for the individual learner – which not every classroom can’ (*ibid.*: 243), while ‘engagement

with the *new* literacies is largely confined to learners' lives in spaces outside of schools' (Lankshear & Knobel, 2006: 30, original emphasis).

Using computers at home gives significantly more opportunities to engage with the new literacies that computer use both demands and affords (such as, accessing information, for homework, by internet hypertext rather than by book printed text): 'Notions of literacy are expanding and the definition of literacy developing as we progress from the Typographical Age into the Electronic Age' (Topping, 1997 :14). New literacies 'permeate every aspect of our lives in the 21st century. Students should become proficient in navigating these media and making sense of them' (Grisham & Wolsey, 2008: 110).

Fluency in these new literacies is part of what it means to be a *digital native*, someone who has 'grown up' with digital technology, who has: 'spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age' (Prensky, 2006: 27). Digital natives, for example, 'rarely even *think* of reading a manual. They'll just play with the software, hitting every key if necessary, until they figure it out (rules are inferred from the reality observed). If they can't, they assume the problem is with the software, not with them' (Prensky, 2001: 59, original emphasis, my parenthesis). Digital natives are contrasted with digital immigrants: the older generation, including their teachers and parents, 'who came to digital technology (or rather it came to us) later in our lives (*ibid.*: 28, original parenthesis).

However, whilst, self evidently, there is a generation of young people who have grown up with digital technologies, this is not the same as saying that the entire generation

shares such a clearly defined set of characteristics as the name suggests. What is probably closer to reality is that ‘different children, like different adults, will have diverse experiences of and attitudes towards new technologies’ (Facer & Furlong, 2001: 467). Bennet *et al.* summarise recent research about young people’s use of technology, and conclude that: ‘these findings suggest that technology skills and experience are far from universal among young people’ (2008: 4).

In the home, computers are used by children for many reasons, of which learning is only one: ‘children undertake a wide range of activities using computers in their homes, but only a limited range of very common tasks: game playing, word processing and looking up information for schoolwork’ (Brown & Davis, 2004: 120). In fact, much of the evidence suggests that ‘children’s use of computers in the home is massively dominated by playing games’ (Buckingham & Scanlon, 2003: 110; *cf.* also Facer *et al.*, 2003, and DfES, 2002).

2.6 COMPUTER GAMES

Games playing is a valuable dimension of computer use (...), it is through games playing that children develop ‘playfulness’ in relation to the computer – a key strategy in effective learning. (Facer *et al.*: 233)

Despite being a relatively new area of research, the literature on computer/video/digital games and digital game based learning is extensive – including, notably, Crawford (1982); Greenfield (1984); Sanger *et al.* (1997); Prensky (2001); BECTA, 2001; McFarlane *et al.* (2002); Buckingham & Scanlon (2003); Facer *et al.* (2003); Gee (2003); Squire & Jenkins, MIT (2003); Egenfeldt-Nielsen (2006); de Freitas (2006); Kirriemuir & McFarlane (2006); Hsi (2007); and Egenfeldt-Nielsen *et al.* (2008).

To begin with, this literature reveals that what actually constitutes a digital game is not self-evident. While, for example, Egenfeldt-Nielsen *et al.* summarise ten possible formal and pragmatic approaches (including, most succinctly, ‘a game is a series of interesting choices’, digital games designer Sid Meier quoted in *ibid.*: 37), Prensky (an exuberant advocate of digital game based learning) (2001) identifies six defining characteristics that he argues are common to most digital games (although not to simulations like *The Sims*): rules; goals and objectives; outcomes and feedback; conflict, competition or challenge; interaction; and representation or story.

There is also a wide range of (overlapping) digital game genres (PEW lists as many as fourteen, 2008). Following ‘Pong’ (1970), the first commercially successful arcade computer game, a digital version of table tennis, there soon were action games (including *shoot-em-up* games), adventure games (exploring virtual worlds, solving puzzles), strategy games (evolving and running anything from zoos to entire civilisations), role playing games (usually fantasy based quests, often played online, sometimes with many thousands of opponent players), puzzle games (such as Tetris), and serious games (including, mostly drill and practice, *edutainment*).

Today, there are many thousands of digital games, from simple *Java applets* on mobile phones and *Flash apps* on the internet, to games consoles such as the *PlayStation* and the *Nintendo Wii*; from complex multiplatform software packages such as *The Sims* or *Grand Theft Auto*, to massively multiplayer online games such as *Ultima* or *Runescape*. And computer games are popular: ‘digital games are clearly an important part of most young people’s lives today. UK figures suggest that nearly 70% of children play computer games every week’ (Kirriemuir & McFarlane, 2006: 8, my parenthesis); new

US research puts this at more than 96%, for teenagers, across the socio economic spectrum (PEW, 2008).

To the digital immigrant, many of these games might appear impenetrable (how they are played and what the aim is), but there's no denying the 'motivational hold' that, due to their 'compelling narratives, activity structure, scaffolding, dynamic feedback, high-quality imagery, and collaborative nature' (Hsi, 2007: 1516), they have on those who play them. In a JISC review of game-based learning, de Freitas identifies yet more attributes of digital games that can increase motivation: 'player sense of challenge, game realism, opportunities to explore or discover new information and learner control' (2006: 5), to which you might also add the state of mind known as *flow*.

Once within the game play, by being kept constantly within their emergent zone of proximal development (perhaps the most effective computer games are 'designed so that they adjust to different levels of play and reward each sort of player', Gee, 2003: 64), gamers can achieve 'a mental state of intense concentration, often to the point where previously difficult tasks become easy and whatever you are doing becomes enormously pleasurable' (Prensky 2001: 124); 'the imperative of total concentration is part of the high' (Turkle, 2005: 82). They are having fun, immersed within the world of the game and in 'an almost automatic, effortless, yet highly focused state of consciousness' (Csikszentmihalyi, 1996 :110) known as *flow*: they are 'so involved (...) that nothing else matters' (Kirriemuir & McFarlane, 2006: 9). This concept of flow is particularly interesting here because, according to Csikszentmihalyi, 'flow forces people to stretch themselves, to always take on another challenge, to improve on their abilities' (1988: 30).

Despite the concerns of some digital immigrants, research suggests that computer game play can be a ‘manifestation of an active and well-adjusted lifestyle’ (Durking & Barber, 2002: 390) – ‘most families used the games systems as a way for the family together to share play activity (...) video games were a positive force on family interactions’ (Squire, undated). In addition, some ‘qualities of game play have a strong and consistent positive relationship to a range of civic outcomes’ (PEW, 2008: v) and ‘rather than signifying academic problems, game play is associated with more positive engagement with school’ (Durking & Barber, 2002: 390).

Indeed, many argue that digital gaming can provide players with significant opportunities for learning (*cf.* all of the studies cited at the beginning of this section, together with Tapscott, 1998; Hsi, 2007; Byron, 2008). In some ways, digital games might provide unique learning opportunities: ‘the ‘affordances’ of games, for example in providing instant feedback, in requiring ‘active’ learning, or in simulating particular types of real-world activities can make them especially well suited to some kinds of educational tasks not offered by many other modes of learning’ (Byron, 2008: 155, original emphasis). At the very least, ‘computer games could be used in educational contexts largely as a means of motivating less engaged pupils’ (Sanger, 1997: 64).

However, as studies have illustrated (*cf.* BECTA, 2001; McFarlane *et al.*, 2002; de Freitas, 2006; Kirriemuir & McFarlane, 2006), introducing existing commercial digital games into the classroom can be problematic (‘opinions among teachers seem to be divided with some enthusiastic teachers using them effectively, some sceptical and some hostile’, EUN). There are a variety of reasons, such as: the lack of sufficiently powerful equipment; the level of expertise required of teachers and learners; the

constraints of the timetable; concerns about the accuracy of the content; the inappropriateness of content (both with regards to the demands of the National Curriculum and in terms of violent and/or sexist storylines); and difficulties convincing management stakeholders of the potential benefits.

This raises the issue of what exactly can be learned by playing computer games. While some commercial games do provide an opportunity to learn some content (such as in games like *Civilization*, where you might learn something about various historical circumstances) the learning is more often incidental and concerned with aspects of the process of learning itself (*cf.* the discussion above of cognitivist learning theories), such as: logical thinking, problem solving (developing successful strategies and overcoming obstacles), confidence building, and effective use of computer mediated information. In short, ‘the educational potential of playing video games may take the form of enhancing the development of certain cognitive skills’ (Gunter, 1998: 71). Learning with digital games ‘may be more incidental than intentional, more deep than broad, but it nevertheless does constitute learning’ (Facer *et al.*, 2003a: 201). Whether this learning is transferred to other contexts, however, is a question that still remains unanswered (*cf.* Greenfield, 1984: 103).

Specifically educational games, *edutainment* titles (as the Catch Up CD ROM 2 might be characterised), ‘the kind that typically combine reading and math exercises with animated graphics’ (Prensky, 2006: 11; for a more detailed description see Facer *et al.*, 2003b: 212) do focus on teaching specific content. But they are less popular: ‘the use of specifically educational software remains relatively limited’ (Buckingham & Scanlon, 2003: 110; *cf.* also Facer *et al.*, 2003b). Facer *et al.* suggest two possible reasons: either

children are ‘actively attempting to protect their leisure time from formal schooled activities’; or else ‘the software environments offered in edutainment packages can rarely compete with more sophisticated and challenging mainstream games’ (2003a: 103). Another possibility is that much edutainment software fails to integrate properly what is to be learned with the game play – they are *exogenous* (external) rather than *endogenous* (internal) (Oyen & Bebko cited by Gunter, 1998). One notable exception is the Kar2ouche series of software (Birmingham & Davies, 2001); although in fact these are closer to simulations than games (sophisticated objects for the learners to think with, rather than rule-bound competitions). In any case, as a result, when using (most) edutainment, ‘children seemed to derive only limited learning and, interestingly, only limited pleasure’ (Facer *et al.*, 2003a: 234).

However, McFarlane *et al.* note that learners *are* happy to engage with relatively primitive drill and practice exercises, when they are wrapped up in the guise of a game (‘chocolate-covered broccoli’, Laurel cited in Galarneau, 2005): ‘drill and practice software in mathematics has proved extremely popular with teachers and pupils. Learners are happy to spend time on such activities, in and out of school; and think of this as ‘play’ or ‘a game’ (2007: 10). Nevertheless, argues another writer, ‘it is important to remain alert so that (drill and practice) does not become the 21st century equivalent of the meaningless ‘busy-book’ found in many a 1970s special school classroom’ (Abbott, 2007: 25, my parenthesis, original emphasis); that edutainment does not become a virtual teaching assistant or, in the context of the home, a virtual childminder.

CHAPTER THREE

Research design

Every decision taken by the researcher should be a reasoned one, reflect the theoretical framework of the methodology employed and be made explicit to others. (Whitehead, 2003: 512)

The design of any research study is informed by a complex range of considerations, from the philosophical (the grounding epistemology and theoretical perspective) to the intensely practical (such as the arranging of mutually convenient interview appointments). Similarly, throughout the literature of social research there are numerous and often conflicting models or approaches, and a frequently confusing or at least overlapping use of terminology.

The educational researcher's reality is further complicated by their very subject matter. As Berliner summarises (2002), educational research (unlike 'hard science') must contend with innumerable, ever-changing, variables (for example, children get older) and their ever-shifting interactions (the dynamics within the classroom, and between the classroom and the world outside): 'educational researchers have to accept the embeddedness of educational phenomena in social life, which results in the myriad interactions that complicate our science' (*ibid.*: 20). In addition, it isn't even possible to gain direct access to what is often the central concern, that of learning: 'the *contexts* of learning, including teaching, can be observed, whereas the cognitive dimension (the

learning going on in an individual's head – or between individual minds) is much more difficult to study' (Sefton-Green, 2006: 9, original emphasis and parenthesis).

Relocating the educational research to the home only compounds things: 'working in families involves very delicate negotiation on a moment-by-moment basis' (Sanger *et al.* 1997: 2) and 'interviews with parents and children may not always be reliable (...) access (and scheduling: fitting in with family life) is difficult eg, into home, private rooms, even bedrooms; data can be difficult to categorise; (and) it is impossible to construct a statistical sample' (Wellington, 2001:239, my parentheses).

Nevertheless, the task is pragmatic – to develop a research design that facilitates addressing as robustly as possible the issues raised by the research questions outlined above; a design that, whilst being cognisant of theory and its complications, is aware of the practical constraints and compromises (such as between the conflicting demands of the research aims and available resources) of the researcher's reality.

Having first briefly considered the theoretical perspective for the current study, the intention here is to outline its overarching research paradigm, the methodology and the specific methods, and then to reflect on some key concerns: research questions, sampling, research ethics, analysis (including generalisability and validity), and evaluation.

3.1 THEORETICAL PERSPECTIVE

The theoretical perspective adopted in this study (its 'way of looking at the world and making sense of it' – Crotty, 1998: 8) is essentially *hermeneutic* (which in turn is

grounded in an *interpretative* epistemology). Here, three key hermeneutic concerns will be mentioned briefly: the hermeneutic circle, prejudices and interpretation.

From a hermeneutic perspective, any given text (or object of enquiry) can ultimately only be understood in terms of its relationship to the system or tradition of which it forms a part and, paradoxically, at the same time in terms of its existence as an individual element of that system: ‘complete knowledge always involves an apparent circle, that each part can be understood only out of the whole to which it belongs, and vice versa’ (Schleiermacher, 1819: 84). Interpretation is therefore complicated by the fact that it has, in effect, no place to start – there is no obvious way in to this (what has become known as) *hermeneutic circle*.

Contrary to the positivist tradition, which assumes *prejudice* to be an obstacle to knowledge, philosophical hermeneutics argues that understanding is always determined by our prejudices, pre-knowledge and assumptions. Our prejudices constitute in effect a fundamental *precondition* of knowledge and interpretation: ‘To try to eliminate one’s own concepts in interpretation is not only impossible, but manifestly absurd. To interpret means precisely to use one’s own preconceptions so that the meaning of the text can be made to speak for us’ (Gadamer, 1960: 398). It is in fact our prejudices that provide a way in to the hermeneutic circle: ‘a person trying to understand a text’, Gadamer argues, ‘is prepared for it to tell him something’ (*ibid.*: 271).

In this sense, interpretation therefore is essentially a creative act, an active process of encounter and response, each interpretation functioning like some kind of dialogue with the object of analysis – it is ‘like a real conversation’ (*ibid.*: 370), although the object of

analysis ‘does not speak to us in the same way as does another person. We, who are attempting to understand must make it speak’ (*ibid.*).

In any case, putting a practical spin on this theoretical position: ‘good practice recommends disclosure by the investigator of his or her expectations for the study, preconceptions, values, and orientation, including any theoretical commitments (...). Having their orientation in mind, whether or not we share it, helps us put their interpretations in perspective’ (Stiles, 1993: 602) – another reason why the declaration of interest given above is essential.

3.2 RESEARCH PARADIGM

Truth in the fields of human affairs is better approximated by statements that are rich with the sense of human encounter: to speak not of underlying attributes, objective observables and universal forces, but of perceptions and understanding that comes from immersion in and holistic regard for the phenomena. (Stake, 1978: 6)

The research paradigm adopted in this study, logically following on from although not necessarily determined by the theoretical position outlined above, is qualitative (‘where quantitative researchers seek causal determination, prediction, and generalization of findings, qualitative researchers seek instead illumination, understanding, and extrapolation to similar situations’, Hoepfl, 1997: 48). This study’s research questions focus on what the parents and children *believe* about their experiences, in the attempt to *understand* what is going on when the parents and children actually use the CD ROM 2 – reinforcing that this study is best served by a qualitative approach.

However, the choice of paradigm is also informed by practical realities. While an experimental study, over time and with control groups, might provide a statistical evaluation of CD ROM 2's effectiveness (which Catch Up might find useful for marketing); and while a large scale survey might, more importantly, provide a rich context for the case-study based analysis (*cf.* 'ScreenPlay', Facer *et al.*, 2003); both of these quantitative approaches are beyond the resources available within the given time constraints to an individual researcher.

In fact, a key issue for some qualitative researchers is that of *usefulness*: 'how useful and applicable (not how universal) they can make their research-based assertions' (Salomon, 1991:11, original parenthesis). Here, the qualitative approach ultimately demands a realistic ambition for this study – rather than definitive, this study aims to be useful. Whilst it might be nice to think it could provide simple answers to the research questions (such as, the Catch Up CD ROM 2 can/can not be used effectively by parents), it was always likely this qualitative study would suggest more questions than answers. Instead, it aims to generate a rich data set which requires an iterative process of interpretation, categorisation and re-interpretation. Such an analysis can only hope to provide a considered understanding of the participants' interpretations (of any benefits the children might have derived from the CD ROM 2), from which useful inferences (lessons that might inform Catch Up's support and the development of future resources) might be drawn.

3.3 METHODOLOGY

This study uses (some aspects of) a case study approach. Although its investigations are neither sufficiently detailed nor sufficiently extended in time to be full case studies, it

does consider the dynamics within a number of *bounded* cases, specifically the six pairings of parent(s) and child: a case study is a ‘study of a bounded system emphasizing the unity and wholeness of that system, but confining the attention to those aspect that are relevant to the research problem at the time’ (Stake: 1988: 258, also quoted in Punch: 2005: 144). In addition, the case study approach is appropriate here as case studies have ‘a distinct advantage... when a “how” or “why” question is being asked about a contemporary set of events, over which the investigator has little or no control (Yin, 2003: 9, original emphasis).

Specifically, this study adopts a *collective case study* approach (the three types of case study identified by Stake being *intrinsic*, *instrumental* and *collective* – cf. 1988 and 2000b) in that, rather than being of a single intrinsically interesting case, it aims to give insight into an issue by considering a number of cases. This is to begin to address the fact that ‘no case within (the target population) preserves all the features of the whole. It is a fragment with a distinct location that shapes its character’ (Gomm *et al.*, 2000:108, my parenthesis).

In short, in the present context (the use of the Catch Up CD ROM 2 in a home environment), this case study approach has been chosen because it ‘allows the researchers to ask fundamental questions about young people’s experiences, motivations and interest in using these technologies’ (Sefton-Green, 2006: 10).

3.4 RESEARCH METHOD

Accordingly, the research method used in this study is *semi-structured interviews* – that is to say interviews based around a list of pre-written questions (see appendices ii – iv), derived from the research questions, in which ‘the interviewer is free to probe and explore within... predetermined inquiry areas’ (Hoepfl, 1997: 52).

All interviews are ‘a conversation, the art of asking questions and listening’ however they are ‘not a neutral tool... this method is influenced by the personal characteristics of the interviewer (Denzin & Lincoln, 2005: 643), as well as by language (which is itself never value free), and by ‘the accuracy of respondent’s memories, people’s response tendencies, dishonesty, self-deception and social desirability’ (Punch, 2005: 176) (‘the interviewer will be inviting a retrospective *rewriting of history* with an unknown bearing on the causal problem with which this research is concerned’ – Silverman, 2004: 8, original emphasis).

However, whilst it might be true that interview ‘data are too often treated at “face value”, as if personal accounts granted the analyst direct access to a realm of the personal’ (Atkinson, 2005, original emphasis), interviews are essentially hermeneutic – the coming together of the interviewer’s and interviewee’s prejudices. As such, the role of the interviewer is to engage in the conversation, to take the interviewee’s responses exactly at face value and then to reflect critically, acknowledging tacitly one’s own prejudices, upon them.

Another method that was originally considered for this study is observation. In fact, the one direct observation undertaken (in the home of one of the participant children), only served to confirm that (although there is a long tradition of successful participant observation in ethnography) the presence of the researcher in a small private space can change the dynamics so much (the child played directly to his new audience) that the original situation (the object of the observation) no longer exists (the object of the observation becomes unavailable to the act of observation). In another study, video

observation (although more difficult in both an ethical and practical sense and so not used here) might be more successful.

3.5 SAMPLING

Having determined the research questions, *what* is going to be asked, the researcher has also to be clear about *who* is going to be asked: ‘In many cases the apparent conclusions of our research are determined less by the social reality under investigation and more by the nature of the sample we use to collect data.’ (Gorard, 2001: 9). The difficulty for the qualitative researcher, however, is the actual process of sampling – as (other than that it should be explicit and valid – *cf.* Miles & Huberman, 1994) there is more agreement about what qualitative sampling *should not be* than what it *should be* (Curtis *et al.*, 2000).

The available sampling techniques are often identified as either *theoretical* (‘designed to generate theory which is “grounded” in the data’, *ibid.*: 1002, original emphasis) or *purposeful* (‘informed a priori by an existing body of social theory on which research questions may be based’, *ibid.*: 1002). In practice, however, these two approaches are often allowed to overlap – acceptable, so long as the sampling methods are coherent as far as possible and, most importantly, are made explicit in the research write up: ‘In qualitative research... researchers have been criticized for not describing their sampling strategies in sufficient detail, which makes interpretation of findings difficult and affects replication of the study’ (Coyne, 1996: 623).

With this in mind, this study uses *convenience sampling*, in the sense that the participant families were introduced by a professional contact (Jacqui Worsley, the Norfolk Local

Authority Computer Assisted Learning Coordinator) and, thus, became part of the project for the reason that they were easily accessible. The participant children were selected by Jacqui Worsley from those children living in the geographic area covered by the school support team of which she is a member, who have been identified as having literacy difficulties. For this study, it is this group which constitutes the strict population, of which the six participant children and their parents (a number large enough to involve some heterogeneity, small enough to be manageable) are the representative group, the sample.

However, the sampling was also *purposeful*, in the sense that they were suggested for particular reasons: *“Mainly because I felt they were reasonable and supportive parents, to be sure that it worked for you (the researcher) really... It was also on the basis of need. All of those pupils have severe needs and it will be interesting to see... whether those needs can be addressed at home using the CD ROM”* (Jacqui Worsley, my parenthesis).

Nevertheless, it should be recognised that ‘far too often cases seem to be selected solely on the basis of convenience and turn out to be atypical in important respects’ (Gomm, 2000: 107). For example, in studies about the use of learning technologies, as Sefton-Green notes ‘often, the young people selected for these studies are extremely motivated to learn’ (2006: 10). Similarly, the fact that the parents were proposed for this study because they were thought likely to be supportive, clearly has an impact on the study. If the study does suggest that the CD ROM 2 can be used effectively by parents in the home, at best this will only be valid for supportive parents such as those in this study. This however is a weak understanding of the guiding research question, whereas the

value of the study rests more with the secondary research questions (in what ways is the CD ROM 2 thought to be effective and what are the consequences) outlined above.

3.6 RESEARCH ETHICS²

Whilst the proposed study is uncontroversial, paying insufficient attention to the research ethics could still compromise the results. Even the commonsense ethical approach, ensuring that an ethical position is adopted throughout and that participants' full and informed consent is secured, needs to be fully considered. For example, providing the participants with the appropriate information about the project but expecting them to decide straightaway whether or not to participate, without giving them time to reflect (to cool off), means that they have not really given (properly considered) informed consent.

To address this here, in order to give them ample opportunity to consider in private what was being asked of them, the potential participant parents were given written information about the research (see *appendix i*) before they gave consent to Jacqui Worsley for their contact information to be passed to the researcher. They were then telephoned twice by the researcher – the first conversation being just to arrange a convenient time to have a second longer conversation, in which the details of the research were restated and a time to visit the home was agreed.

² This study, 'Evaluating the use of the Catch Up CD ROM 2 in a home environment', was granted research ethics approval by the University of Oxford's Social Sciences and Humanities Inter-divisional Research Ethics Committee (IDREC): reference: SSD/CUREC2/08 – 41.

During the second telephone conversation, a number of ethical considerations were discussed and undertakings given by the researcher: that an ethical position would be adopted throughout the research (for example, their privacy would be respected); that they had the right to withdraw (at any time without having to give any reason); that parental supervision would be required at all times that the researcher was in the presence of the children (to protect, in complementary ways, the children and the researcher); and that in the write up the participants would be anonymised (by changing names and excluding any references that might make it possible to identify them).

At the first meeting at the family home, before the first interview, the details of the project (including these ethical considerations) and what was being asked of them (using the CD ROM 2 for approximately three weeks, completing a log sheet, taking part in interviews) were again restated and the families gave signed consent for their involvement.

3.7 DATA ANALYSIS

Data analysis should be grounded in the research questions and should continue the rigour established in the sampling and data collection: 'A thorough, well prepared, and well documented analysis is what distinguishes scientific approach from superficial conjecture' (Malterud, 2000: 486). The analysis should also adopt a critical hermeneutic approach to the data, if only because the families may have put a positive gloss on their experiences in their eagerness to demonstrate their commitment to their child and to please the researcher.

Miles and Huberman (1994: 8) identify three broad approaches to qualitative data analysis, each of which derive from their underlying epistemology: *social anthropology* (including ethnographic methods which ‘tend towards the descriptive’, *ibid.*), *collaborative social research* (such as *action research* in which the aim is to affect social change through research), and, of particular relevance here, given the theoretical perspective outlined above, *interpretivism*. However, common to all these approaches, and their many variations, are some key analytical methods: such as data reduction; data sorting; identifying similarities, differences, relationships, patterns and themes; and drawing valid generalisations, which are then compared with existing theory. This process is similar to that outlined by Marton & Säljö (1997) as ‘phenomenographic’ (iteratively developing categories of responses from a close reading of all the data and drawing inferences), and is the process (rather than formal coding) drawn on in this study.

Whilst the insights, derived from this analysis, into the particular cases may be interesting in themselves, in a simple sense they will also be generalisable: naturalistic generalisation is ‘arrived at by recognizing the similarities of objects and issues in and out of context and by sensing the natural covariations of happenings’ (Stake, 2000a: 22). A larger question, though, is whether this qualitative research is generalisable to the wider population, in an analogous way to quantitative research. Gomm *et al.* (2000) suggest that it can be, so long as the researcher considers carefully how and in what ways the case-studies are representative of the population heterogeneity: ‘how the case(s) we are studying might be typical or atypical’ (*ibid.*: 105, my parenthesis).

This last point also suggests the issue of validity: 'If qualitative studies cannot consistently produce valid results, then policies, programs, or predictions based on these studies cannot be relied on' (Maxwell, 2002: 37). Qualitative researchers have typically adopted one of two approaches: they have argued either that questions of scientific validity are irrelevant to the qualitative project or that qualitative research requires an alternative understanding of what it means to be valid.

Maxwell notes that, 'as observers and interpreters of the world, we are inextricably part of it; we cannot step outside our own experience to obtain some observer-independent account of what we experience. Thus, it is always possible for there to be different, *equally valid* accounts from different perspectives' (*ibid.*: 41, my emphasis). Indeed, as mentioned above, the hermeneutic position is that the meanings uncovered by the research exist only in the interaction between the observer and the observed. At the very least, the researcher must be open to the fact that a different observer will observe something different. Thus, 'validity is always relative to, and dependent on, some community of inquirers' (Maxwell, 2002: 43).

Maxwell outlines a typology of validity for qualitative research that provides a useful frame of reference for this study (*cf.* also Miles & Huberman, 1994: 36). Qualitative research, he suggests, may be considered valid if it is *descriptively valid* (if it describes what actually happened), *interpretively valid* (if it represents accurately what the observed phenomena mean to the people engaged in them and acknowledges the position of the researcher), *theoretically valid* (if from its empirical observations can be derived an internally consistent theoretical understanding), and *internally generalisable*

(generalisable within the community group, rather than to other community groups) (Maxwell, 2002: 45-55). It is in these senses that this study sets out to be valid.

3.8 EVALUATION

(Evaluation is) the process by which people make value judgement about things. In the context of learning technology, these judgements usually concern the educational value of innovations, or the pragmatics of introducing novel teaching techniques and resources. (Oliver, 2000: 20)

As this study sets out to evaluate how the Catch Up CD ROM 2 might be used in a home environment, the process of evaluation itself ought to be considered. Firstly, ‘what distinguishes evaluation research from other forms of social research is not the methods evaluators employ but the purpose to which the methods are put’ (Clarke, 1999: 2). As mentioned above, Patton argues that ‘evaluations should be judged by their utility and actual use’ (1996: 20). In addition, ‘methodological concerns about validity, reliability and so on are considered (by Patton) secondary to whether or not the process helps people to do things’ (Oliver, 2000: 21, my parenthesis). In terms of learning technologies, the purpose of evaluation becomes ‘to provide the designer or user with enough evidence on which to make confident judgements regarding the effectiveness of the innovation’ (Jackson, 1998: 22), sometimes in order to ‘result in the redesign or adaptation of the implementation to improve its performance (*ibid.*).

Evaluation may be either internal (conducted, as in this study, by a member of the team) or external, formative or summative, centre on process or outcome, emphasise cost-benefits or consumer satisfaction, or adopt a pluralist approach centred on the differing needs and interests of stakeholders: ‘A comprehensive evaluation is not simply about

identifying a set of objective, quantitative indicators that can be used to measure success, but is also about describing the nature of the interaction that takes place between the different stakeholder groups' (Clarke, 1999: 19; *cf.* also ELT, undated, and Oliver & Conole, 1998). Accordingly, evaluations should take into account that 'stakeholders typically have diverse and often competing interests' (Patton, 1996: 42).

Kreber *et al.* suggest 'six possible levels on which to evaluate' (2001: 100), centred on the interests of three key stakeholder groups: teachers (which, here, becomes Catch Up), the students (the participant children) and the institution (the children's families). Despite being designed for institutions, Kreber *et al.*'s general (and essentially qualitative) categories remain useful for this study: perceptions and levels of satisfaction, beliefs about teaching and learning, teaching performance, student's learning, and impact on the institution (family).

Goyne *et al.* (2000), on the other hand, focus specifically on the technology, suggesting twelve straightforward questions they believe should be asked when evaluating educational software, including: 'Is the software consistent with the curriculum and learning outcomes?'; 'Does the software provide positive, formative feedback and achievement measures?'; 'Is the software appropriately challenging?'; and 'Will the software foster learning in an authentic, relevant context?'. The links with the theories on learning outlined above are clear.

3.9 THE STUDY

Having previously outlined the beginnings of the research (the sampling of and initial contact with the participants), here the remainder of the process will be summarised. At

the first meeting in the family home (which mostly took place in kitchens), the children and parents were interviewed (see *appendix ii*), to establish a context for the study. Each family was then given, for them to install, a retail copy of the CD ROM 2 (including the CD ROM disk and User Guide). One of the participating children was loaned a laptop computer on which CD ROM 2 had already been installed; one mother asked to have the CD ROM installed on her children's computer.

The parents were given a simple A4 log sheet (already marked up with the days of the week and with columns for start time, end time, game played and comments – see *appendix v*) on which they were asked to record the frequency of their children's interaction with the CD ROM 2 and any comments. The parents were then asked to arrange for their child to play CD ROM 2 for an *ideal* of 15 minutes each day of the study. The fact that this was an ideal, which might not be easy to achieve in a family context, was acknowledged and reinforced. No other advice about how, when or where to play the CD ROM was given.

After approximately three weeks (or, in the case of one of the participating children, because of holiday trips, after seven weeks), follow up interviews were conducted with the parents and children, again at the family homes, and the log sheets were collected. And finally, an interview was conducted (see *appendix iv*) with Jacqui Worsley, the Norfolk Local Authority Computer Assisted Learning Coordinator who had facilitated the study by introducing the families.

CHAPTER FOUR

Description of the data

4.1 THE CONTEXT AND PARTICIPANTS³

4.1.1 GEOGRAPHIC, SOCIO-ECONOMIC, AND EDUCATIONAL CONTEXT

The six families who participated in the study all live in Norfolk – which is in the east of England – in an administrative district called Broadland, a collection of leafy suburbs, small towns and villages situated to the north east of the county city of Norwich. The population of Broadland is overwhelmingly ‘white’ (more than 99% according to the National Statistics, 1991) and the primary schools (all of the children who participated in the study are of primary school age) generally perform above the county and national averages in the Key Stage 2 English, Maths and Science Standard Achievement Tests (National Statistics, 2008).

Underneath the apparent homogeneity of this sample of families (living in Broadland with a primary school age child who has difficulties with reading and a parent who wishes to provide additional support), interviews with the parents and children hinted at the complexities of their real lives: ‘social reality confounds our simple armchair theorising: it is more messy, more convoluted and more surprising than we thought it would be’ (Gherardi and Turner, 2002: 84).

³ The names of all the children have been changed, to ensure their anonymity.

4.1.2 OLIVER

Oliver, at 8 years and 6 months, is the youngest child to participate in the study. He lives with his mother, father and younger sister in a small, newly built semi-detached house on an extended estate of similar houses. His mother describes Oliver as dyslexic (she sees him experiencing the same difficulties that she experienced as a child, although her dyslexia wasn't identified until later in life). This, together with the fact that between the ages of 5 and 6 he suffered from hearing problems, means that Oliver struggles at school and lacks any self-confidence. His difficulties are such that he has recently been assessed for a Statutory Statement of Special Educational Needs. In particular, Oliver's reading age is now more than two years behind his chronological age, which is probably why the books he has to read at school are usually, as he describes, "*babyish*". Oliver prefers reading at home with his mother.

The one computer in the house is set up near the main door to the living room, in the opposite corner to a television. Whilst his mother explains that everyone in the house has to "*fight for access*" to the computer, Oliver rarely uses it – he thinks that it is mostly "*boring*" and prefers instead to play with his Lego building bricks. The only computer games he has played are some online games, found by his mother on American websites, designed to support dyslexic children, and one or two games from the Catch Up CD ROM 1.

4.1.3 CATE

Cate, aged 9 years and 1 month, lives in a large detached individual house, at the end of an unmade cul-de-sac, with her mother, father and elder sister. She likes books but struggles with words (like Oliver, Cate is identified by her mother as 'dyslexic'). As a

consequence, Cate lacks in self-confidence at school and has a reading age almost two years behind her chronological age. Nevertheless, she still enjoys reading at school, where, she explained, she is helped by her friends (much as she enjoys reading, with her mother's help, at home). Meanwhile, in recognition that "*you can't rely completely on school*", Cate is provided with private, on-going extra-curricula tuition.

The computer to which Cate and her sister have access (her parents have their own laptop computers) is situated in the play room next to the kitchen (Cate's mother explained that she wouldn't allow computers in the girls' bedrooms as it "*is important for someone to be around.*"). The playroom also contains a television and sofa.

Computer time isn't strictly rationed, which isn't a problem as, "*unlike some kids*", Cate and her sister are "*never desperate to get onto the computer*" – an observation which is reinforced when, in response to her mother's comment "*I can't imagine being without a computer.*", Cate quickly interjects: "*I can!*" She prefers ballet classes or Brownies. Nevertheless, Cate does enjoy occasionally playing computer games, mostly online games from the BBC, and has limited experience of *The Sims*, a simulation game and the Sony *PlayStation* console.

4.1.4 LEWIS

Lewis, 9 years 3 months, lives in a large detached modern house on a quiet estate, with his mother, father and elder brother and sister. Despite, as his parents explained, lots of hard work and considerable help from his teachers, Lewis finds literacy particularly difficult – to the extent that, as he explained, he often feels "*like running away from school*". In any case, he definitely prefers reading at home. Lewis's parents recognise that the school simply doesn't have sufficient resources (time, specialist trained staff or

specialist equipment) to provide Lewis with the support that he needs, such that they must work in partnership with the school to do whatever they can at home. Lewis has recently been assessed for a Statutory Statement of Special Educational Needs.

Lewis has access to two laptop computers (one loaned from the school and one with a broken screen, that is used with an external monitor as a pseudo-desktop computer, that lives in his bedroom) and to the family desktop computer. He uses computers for researching on the internet, for homework, and for playing games – ranging from *Zoo Tycoon* and *Lego Creator* to online games – although, as his mother explained, he'd usually "*rather be outside doing other things*". Lewis also commented that he found reading the text on computer screens, for example on websites, more difficult than reading a book, because there is "*often a lot more writing*" – although he does enjoy reading some electronic books that are designed to be read on screen.

4.1.5 BEN

Ben, 10 years old, lives mainly with his mother in a small semi-detached estate house; he also spends time at his father's home. Although he has a good memory for words, Ben struggles with literacy (he is dyslexic, as is his father), particularly with writing. As his mother explained: "*Ben can write it, but only Ben can read it.*" She believes that, until recently, he wasn't given the help at school that he clearly needed, and this in turn "*affected him a hell of a lot*" – damaging his self-confidence and spoiling his enjoyment of (engagement with) school (leading to some behavioural issues). Ben has been assessed for a Statutory Statement of Special Educational Needs.

In Ben's home there are no computers (one was loaned to him for the duration of the study, which was set up in his bedroom), but he does have a *PlayStation* on which he plays frequently and has achieved (according to both Ben and his mother) a high level of mastery. Having said that, Ben is a child who much prefers to be out on the streets (of this quiet estate) playing with his friends. In fact, in many ways, Ben comes across (at least to me) as, by far, the most *streetwise* of the children in the study.

4.1.6 LAURA

Laura, 10 years 3 months, lives in a large individual bungalow in a street of mixed housing with her mother, father and elder sister. Laura suffers from a chronic condition that, among other things, has impacted on her cognitive development, in particular on her literacy and numeracy skills. She receives additional support at school and will shortly be formally assessed for a Statutory Statement of Special Educational Needs. Despite her difficulties, Laura enjoys reading, particularly adventure and mystery stories, and particularly at school (rather than at home), where, she says, her teacher gives her help.

Laura's family share a computer (her parents also have their own laptops), which is located in the corner of a small room that also functions as a corridor into the kitchen. This is clearly a busy location, at the centre of the home, which allows Laura's mother to "*keep an eye on her*" whilst Laura is using the computer. As with all the families, access to the computer isn't formally rationed – for Laura, using the computer is "*just one of the things she likes to do*". Having said that, Laura does prefer writing on the computer to writing with a pen, because she finds it physically easier: "*you don't have*

aching hands". She also enjoys playing some computer games, particularly those on the CBBC website.

4.1.7 JOE

Joe, 10 years 8 months, is the oldest child to participate in the study. He lives in a large, individual house in a village street of mixed housing, with his mother and father, who run their own small business, and four older siblings. Although Joe has been identified, like one of his brothers, as dyslexic, recently his reading has "*come on leaps and bounds*" such that the school, Joe's mother explained, "*is very pleased with him*". At home, his mother is keen that he is "*scheduled*" to do something educational every day, although she isn't exactly sure what he should be doing, apart from reading books, and is waiting for suggestions from the school. Although Joe clearly prefers reading at home to reading at school – reading to his mother "*is nicer*" – he would never, his mother explained, of his own volition pick up a book to read. He would rather, whatever the weather, be in the garden on his trampoline.

Everyone in Joe's home, including Joe, has their own computer. The boys, Joe's mother explained, use their computers mainly for homework. The girls also use them for social networking – when they "*should be out socialising!*" Despite this occasional slightly negative attitude toward some potential uses of the computer, Joe's mother believes that computers have generally made a positive impact on learning (with homework, for example, "*it's not so daunting looking for information on the web than in a giant book.*"). In fact, she explained, in their home it is "*the job of the computer to support (Joe's) literacy and numeracy*" and she would like him to use his computer more often. Joe also has access to his older siblings' computer games and the family's games

consoles (*PlayStation* and *Xbox 360*) – but he would still rather be in the garden on his trampoline.

4.1.8 JACQUI WORSLEY

Jacqui Worsley has played a crucial role for this study, facilitating my contact with the children who participated, for which I am very grateful.

Jacqui has two areas of professional responsibilities. Firstly, she is a member of the Norfolk Local Authority's Educational Psychology and Specialist Support Service school support team, where she is involved in supporting children who have special learning needs. It was through this work that she identified the children and families who took part in this study. Jacqui explained that most of the parents she works with are concerned about their child's lack of progress but, although keen to do so, are unsure how best they might provide appropriate support – a problem reinforced by the fact that most family homes are busy places, with many conflicting demands on time, and by the varying quality of communication about their child that parents have with schools. And while many children are happy to engage in learning activities at home after school, others, particularly those who struggle in the classroom, are often keen to leave learning behind for the day.

Jacqui's second area of responsibility is (as mentioned previously) as Norfolk LA's Computer Assisted Learning Coordinator, where her job includes keeping colleagues up to date with developments in software suitable for children with special learning needs – particularly in literacy. Jacqui spoke positively about the Catch Up CD ROM 2, but she was critical about how it (and other similar software) is used in schools: "*the problem*

with all these programmes, that I've observed in schools, is that they are rarely used in the way that they are intended to be used – they are an undervalued resource really.”

They are neither used regularly, over an appropriate length of time, nor monitored effectively. *“One of my biggest frustrations is that you can suggest a programme that you know will be just what that pupil needs”* but the obstacles in the classroom *“are too hard to overcome”*. She believes that more training and guidance is needed, for example to ensure that struggling readers are only given games to play that are appropriate for their current ability – if the games are too hard, they will just lead to more frustration; if the game level is appropriate, they will see themselves making progress, adding to their motivation to continue.

4.2 USING THE CATCH UP CD ROM 2

4.2.1 OLIVER

On the first full day of the study, Oliver was up at 6.45 in the morning – his father had promised to install the CD ROM the previous evening and Oliver was excited to get going. Over the three weeks of the study, he went on to play the CD ROM fourteen times, for a total of more than five and a half hours. Mostly he played once a day, excluding weekends, for between 10 and 30 minutes, usually in (what his mother called) “*quiet time*” (when television wasn’t permitted, and while his sister was out) after the evening meal.

For the first week, Oliver’s mother sat with him, getting him started then helping him through the games – initially, as with other activities, he didn’t have the confidence to start off on his own. Soon, however, it became clear that he no longer wanted his mother to sit with him, so she moved first to the sofa, to watch; then, as he grew in confidence, she stopped supervising him completely. That this was possible with the CD ROM was for Oliver’s mother a big plus: “*Sometimes you just don’t get time to keep going over things. You’re trying to cook, and they go ‘what’s this word’, ‘what’s that word’...*”.

Oliver very much enjoyed playing the CD ROM, choosing which games to play and when (even though, by playing games out of order, he found some of them too difficult). It wasn’t like picking up a book, it wasn’t like school work, and it didn’t matter if he made a mistake – he didn’t get told off, he could just do it again. In short, for Oliver, the Catch Up CD ROM was all about enjoyable learning: “*It can make your reading better, your spelling better. You have a lot more fun reading and spelling!*”

Oliver's parents agree, although for them the key impact was a noticeable boost in his self-confidence. They also believed that he benefited from the repetition inherent in the CD ROM's *drill and practice, beat your time*, format.

Oliver and his parents all valued the opportunity to have the CD ROM at home. Unlike school, there were no particular time pressures (*"At school, I wouldn't have long to use it."*), no dragging him out of lessons or activities that he enjoys (*"I don't want his problem to stop him doing fun things at school."*), no noisy and distracting children. And more than that, having the CD ROM at home gave Oliver's parents an opportunity to support his learning directly, and to understand his progress in literacy.

4.2.2 CATE

Cate and her mother found it difficult to find time for the CD ROM – it was the end of the school term and there were lots of school events to attend. It was *"not a good time of year"*. Nevertheless, Cate did use the CD ROM six times during the three weeks, clocking up more than two hours of play. When she was using the CD ROM, playing games in no particular order, Cate always insisted that her mother sat with her (although once her older sister took this role): *"If I walked away she'd call me back."* This her mother put down to Cate's lack of confidence and her need for frequent encouragement: *"She likes me to check that she's doing it correctly."*

Whilst she certainly enjoyed some of the CD ROM, such as feeding the dinosaur, for Cate the *"easy"* games were *"boring"* and the *"hard"* ones too hard. The higher order games, for example, which appear in the last world on the CD ROM, she wasn't able to complete. Overall, she found the CD ROM *"wordy"*, particularly when compared to her

preferred (edutainment) CD ROM *Nessy*. She would have liked games featuring ballerinas or, as her mother put it, “*other subjects she can relate to*”. And in any case, if she was going to be playing a computer game, she would, she hesitated to say to me, far prefer to play the family’s new *Nintendo Wii*.

For Cate’s mother, using the CD ROM hadn’t been particularly successful. It had only been played the six times and there hadn’t been any noticeable impact – Cate hadn’t, for example, remembered any of the strategies. Nevertheless, her mother did value the drill and practice repetition in the games: “*That’s how we learn, isn’t it, by constant repetition (...) but they don’t realise there’s repetition, it’s quite clever in that way.*” She also valued having the CD ROM at home, “*if she hasn’t got anything much to do (...), you can read, but it’s something interactive they can look at, and they prefer to do something like that really because it’s more interesting to them.*”

4.2.3 LEWIS

Lewis mostly played the CD ROM during his daily ‘family time’ (rather than ‘homework time’ or ‘free time’), on his mother’s bed while she rested her injured back – he always wanted either his mother or father to be with him, and they were keen to provide encouragement and praise. His parents were particularly pleased to have an opportunity at home to support his literacy and to see his progress. During the study, Lewis played the CD ROM eleven times, for a total of just over 4 hours, initially working through all the games in order.

Lewis was excited to get started with the CD ROM, it wasn’t learning or homework, and he often had to be told when to stop – he preferred, he explained, playing the

CD ROM to “*doing literacy*”. The pictures and animations, he thought, were “*realistic*”. They were “*almost as good*” as those on the family’s Xbox console, and an important part of his enjoyment. For Lewis’s parents, on the other hand, they were pleased that the designs were appropriate for an older child (someone of Lewis’s age) whilst the educational content still focused on basic literacy (at the level of most younger children).

His first play of any game, Lewis often found particularly challenging. But, once he had grasped the pattern (sometimes by watching his father play), his times would drop dramatically – which he found very satisfying. Returning to the game on another day, and again usually beating his time, demonstrated to Lewis and his parents that he had remembered the strategy. Thinking about what he had achieved playing the games, Lewis was convinced that his “*spelling definitely has improved*”.

Nevertheless, the novelty did begin to wear off. Lewis occasionally became bored half-way through a game, particularly when he had already beaten his time. Towards the end of the study, once they were familiar with the CD ROM’s content and had seen that some games were “*above his ability*”, his parents encouraged him to focus on just four or five games that they thought appropriate to his skill level. Whilst they believed that this was important for his learning (in fact, they would have liked the CD ROM to have done this automatically), they also recognised that limiting him to such a small subset of the available games probably contributed to his “*dwindling interest*” (he didn’t play the CD ROM at all during the last ten days of the study). Lewis, on the other hand, thought that the repetition (the drill and practice approach) was helpful: “*You get better until you’ve got it.*”

4.2.4 BEN

Ben “*wasn’t enthusiastic*”. As far as he was concerned, the graphics were “*babyish*”, especially when compared with his *PlayStation*, and it was “*work*”, he’d much prefer to be playing outside with his friends. His mother reinforced this. It was a struggle to get him to use something that he identified as learning, despite the fact that the learning was wrapped up in, what she saw as, some “*fantastic*” graphics and games: “*I don’t think for a minute Ben thought, ‘Cor, this is really great... and I’m learning so much as well’*”.

Nevertheless, his mother reported that he did play the CD ROM, often with her supervision, about 30 times during the 7 weeks that he had the loan of the laptop. And when he did play, he found it easier and more enjoyable than reading a book. In fact, he was, according to his mother, “*chuffed*” when he got to the next level or beat his best time, but when he found a word difficult, or if he missed a word spoken by the computer, he quickly lost interest.

Although she was firm that the CD ROM wasn’t suitable for home use, other than as a replacement activity for homework reading, Ben’s mother did believe that the way the games were written did support his learning. She thought the repetition (drill and practice) and competition (beat your best time) were essential, as was the opportunity to talk with him about what he was doing, which she saw as “*another useful way of getting him to learn*”. She also liked being able to see “*where Ben was at*” in his literacy: “*he does this stuff at school, but I’m not there to see it*”.

4.2.5 LAURA

Laura played the CD ROM only seven times during the study, for a total of just under two hours (the shortest time recorded in the study). Partly this was because it was a busy time at school, but mostly it was because, although “*keen at the start*”, once she had played all of the games she quickly lost interest. She did enjoy the pictures, animations, stories and challenges but wasn’t interested in trying to beat her best times. As soon as one game was finished, she moved onto another, randomly and rapidly working through the CD ROM. Although Laura found most of the games too easy, she thought that she had definitely learned, “*improved*”, from the challenges and practice in the later, more difficult (higher-order), games.

Generally, the CD ROM fitted well into family life, although it was sometimes difficult for her to get onto the computer (while it was being used by another member of the family). Usually she played the games on her own, while her mother worked in the adjacent kitchen. Although, according to her mother, she didn’t ask for any help, she presumably got some – to her mother’s amusement, Laura explained that she would have preferred to use the CD ROM at school, “*so I don’t have mum telling me how to do it*”. Her mother, however, was pleased to have it at home, she saw it as an opportunity to support Laura’s literacy progress and believes that, for Laura’s future, “*the more exposure (to computers), the better*”.

4.2.6 JOE

Joe’s mother was glad of the CD ROM, as it gave him something educational to do each day at home; although it had to be part of a routine, “*otherwise it wouldn’t get done*”. Knowing that he would never initiate it, she would “*catch him*” after tea, each

weekday, and first thing, at weekends – a strategy that meant he played the games for a total of almost six hours (the longest of any participant) across 20 sessions.

Once he did sit down to play, he did enjoy it, particularly the stories and beating his own times (“*you get a good feeling*”). At the beginning, his mother couldn’t get him to stop but as he became more familiar with the games it became more like school work – better than reading a book, still not as good as playing on his trampoline.

Joe’s mother was pleased with the scope of the CD ROM’s content (reading and spelling, words and sentences, listening), and was impressed by the skills that he demonstrated, “*I’ve never really seen him do anything like that before... it was a nice surprise to see what he could read*”. Usually Joe would play on his own, sometimes his mother would sit with him; often she would ask him about the games that he’d played. She also believed that the fact that they were games certainly contributed to his learning, “*when he’s relaxed, you definitely get more out of him... I think he’s definitely gained.*”

4.2.7 TABULAR SUMMARY OF INTERVIEW DATA

TABLE 1

	OLIVER	CATE	LEWIS	BEN	LAURA	JOE
Enjoyed?	Yes	Yes	Yes	A little	At first	Yes
Played willingly	Yes, until towards end	No	Yes, until towards end	No	Yes, initially	No
Prefer playing at home or school?	Home	Either	Home	School	School	Home
Any learning?	Yes	No	Yes	Yes	Yes, with later games	Yes
Value of repetition	Good	Good	Good	Good	Good	Good
Value of competition	Good	Good	Good	Good	Not interested	Good
Mostly supervised	50%	No	Yes	50%	No	50%
User guide?	Only when programme froze	No	Towards the end	No	At the beginning	No
Order games played	Random	Random	In order, then random	Random	In order, then random	Random
Graphics important?	Yes	Yes	Yes	Yes	Yes	Yes
Compared to commercial games	-	Not as good as a Wii	Graphics as good as an Xbox	Not as good as PlayStation	Not as good as CBBC	Different to Xbox

CHAPTER FIVE

Analysis

5.1 INTRODUCTION

As suggested earlier, this analysis raises more questions than provides definitive answers – although questions that might usefully inform future research and development of digital games for learning. To help negotiate the quantity of interview data generated by the qualitative approach, the intention here is to structure the analysis strictly according to the research questions, informed by the discussion above of evaluation (‘evaluations should be judged by their utility’, Patton, 1996: 20).

Firstly then, to provide a context for the analysis of the data, evaluations should consider beginning with a stakeholder analysis. Here (leaving aside the University of Oxford’s Department of Education, with whose guidance the research has been conducted, and the wider *games in education* research community), the three key stakeholders are: Catch Up (the teachers in Kreber’s model mentioned above – 2001), the participant children (the students) and the children’s families (the institution). The interests of a fourth stakeholder – me, the writer of this dissertation – also needs some mention.

The potential complexity of needs across these stakeholders, for what is after all a small study, is clear. Nevertheless, there are some common stakeholder interests: at the very least, for the research to be conducted ethically and, presumably, for the participating

children to benefit from the experience. Some of us, however, because of our professional investment in the subject of the study, the Catch Up CD ROM 2, clearly have more at stake – and might be expected to have a particular interest in the results of the evaluation being positive.

Catch Up's ambitious mission 'to address the national problem of underachievement in young people which has its roots in literacy and numeracy difficulties' gives them a specific interest in ensuring that its resources (such as CD ROM 2) are as effective as possible. If the resources are effective and well thought of, they reason, they will be taken up more widely (possibly by parents), and more struggling learners will benefit from them. Catch Up also has a financial interest: as a charity it doesn't take profits, but its income from sales of the CD ROMs does enable it to invest in the development and dissemination of resources. With all of this in mind, a hope for Catch Up is that this evaluation does show that CD ROM 2 can be used effectively by parents. Nevertheless, they are more interested in learning how they might best ensure that this is the case.

The participant children, as is clear from the interviews, are as heterogeneous as you might expect from a group of six individuals (from the same semi-rural area) – different family contexts, different experiences, different abilities, different needs. Nevertheless, in the present context, their individual interests do more or less coincide. As children who are struggling to learn to read, they are looking for effective support: that will help them become more confident readers, that will help them negotiate the demands of school more easily, that is appropriate to their age and interests, and that is fun.

The participant families are equally distinctive. In this small sample, there is a range of homes (from small semi-detached to large detached houses) and locations (from

housing estates to villages); they are mostly two parent families, but there is one single parent household; there is a family of five children and a family with just one child; there are homes with many computers, one with one computer and one with no computers; there are homes with few computer games and homes with the latest games consoles – all indications of a range of socio-economic status. There are also computers in the living room, in rooms next to the kitchen, in bedrooms... and roving laptops; and there are families who prefer to structure their child's use of the computer and those who see it as just another thing in the home – further indications of a range of attitudes.

Nevertheless, despite how it might be realised from home to home, all the parents do share a similar interest in supporting their own children – who, they recognise, suffer because of their difficulties with reading. All of these parents were enthusiastic, they were chosen to be invited to join the study for that reason; they were keen to see how the CD ROM 2 might help them give their child appropriate support. Some, it must be said, also seemed to be interested in simply having something to fulfil the role of *appropriate daily home learning activity* and were happy to use a programme recommended by someone whose opinion they value (Jacqui Worsley) in lieu of the lack of suggestions for support (they explained) that they had received from school.

Me, the writer of this dissertation: as a consultant to Catch Up and the producer of CD ROM 2, my interests partly coincide with those of Catch Up (in learning how we might best ensure that CD ROM 2 can be used effectively by parents). My stakeholder position is complicated however by my status as a candidate for an MSc degree (for which this dissertation is being written) who has an interest in the development and

further study of effective digital games for learning. My stakeholder interests (my prejudices) constitute my entry point to the following analysis (interpretation).

5.2 HOW IS THE CATCH UP CD ROM 2 USED BY PARENTS?

Whilst some parents encouraged their children to work mostly independently, others supervised most of their use of the CD ROM 2. Enabling the children to work independently contributed to noted increases in self-confidence (which is in many ways a precursor to success, particularly for struggling learners). The CD ROM was also used, at least occasionally, as a virtual childminder – mentioned earlier as something probably to be avoided. However, childminding is an everyday necessity for most family households; and, when playing CD ROM 2, the children were at least safe and productively occupied, allowing their mother to get on with the other demands of the family.

The reasons given for supervising closely, on the other hand, might be grouped into three: technical (to provide computer assistance, such as getting the programme going or dealing with a crash, or help negotiating the CD ROM interface); to control access (to ensure that it was used at appropriate times, or to ensure that their child did actually use the CD ROM when they were supposed to – most important when the parent was more enthusiastic than the child, and when the computer was not in a shared space); and pedagogical (to provide help with the learning activities; to ensure that the child used the learning activities appropriately, to discuss the learning, to find out about the child's reading capabilities; and to share as a fun activity).

These have various implications for the effective use of CD ROM 2 and future digital games by parents. On a technical level, digital games must be both robust (two families reported that one game in CD ROM 2 had crashed, probably a consequence of the tight development budgets typical of edutainment titles) and easy for children to use independently (although the parents thought CD ROM 2's interface to be mostly self-explanatory). But more generally, there is clearly a need for better guidance (guidance for parents about how best to use books has been shown to help accelerate reading achievement in children – Topping, 1997). In particular, parents can't be expected to have an expert knowledge of reading difficulties, and so they need guidance about how to use the CD ROM 2 (or indeed similar resources) to support a struggling reader's literacy needs. At best, if the parents (or school staff) do not have appropriate guidance, the learners are not getting the full benefits of the CD ROM. At worst, failure is repeated, the children's often low self esteem is reinforced, they become less interested in reading, and 'the negative spiral of cumulative disadvantage continues' (Stanovich, 2000: 393).

Guidance needs to emphasise, among other things: when and how often to use CD ROM 2; what literacy specific guidance to give (what reading strategies to use); the importance of automatic word recognition to reading for meaning; the informal and playful aspects of learning to read; the value of digital games as motivator for learning (which is less likely to be achieved if they become compulsory); how best to prepare for (concrete preparation) and integrate the learning into the child's individual context and learning experiences (bridging) (*cf.* Adey *et al.*, 1998); the value of sharing the learning with the child through joint participation (social construction: Lewis's parents reported how much pleasure and learning he had got out of watching his father play some of the

games) and talking about the learning (metacognition: Ben's mother said how much he had got out of discussing with her what he was learning about); the importance of positive feedback which can immediately be acted upon (*cf.* Black and Wiliam, 1998); and the critical importance of ensuring that the child plays games that are within their zone of proximal development – challenging but within grasp of their current abilities – avoiding games that are too difficult, to prevent failure and frustration, and repeating games until mastery is achieved. A long list no doubt – but if only some of this guidance can be put into practice, learning with the CD ROM 2 could be significantly enhanced.

However, to make this happen, the guidance also needs to be accessed. At the beginning of the project, when they started with the CD ROM, the printed User Guide (supplied in the CD ROM case), which does provide comprehensive information, was read by only one of the parents – to find out about the focus of the games. Another parent used the guide once they were familiar with the games and were ready to learn more; a third parent looked at the guide only on the one occasion that a game crashed; and the remaining three parents didn't use the guide at all – instead they assumed they'd be able to figure it out (this clearly isn't just a characteristic of Prensky's digital natives after all).

For this reason, only one of the parents was aware that they could (by using the teacher's information screen) find out about their child's achievements (a record of their scores – *cf.* Goyne, 2003), and switch easily to another game without having to work through all the games in a world, or that they could leave a game midway. This is not to be critical of the parents, but to make the point that the comprehensive guidance that

Catch Up do provide is not getting through – the 32 page printed User Guide approach does not appear to be effective.

5.3 WHAT DID THE CHILDREN GAIN FROM USING CD ROM 2?

The short duration of this study (approximately three weeks) meant that it was always unlikely that the children would make measurable Reading Age gains (which is another reason why there was no standardised pre and post test). Instead, the aim here was to understand what they children felt they had got out of using the CD ROM 2.

Firstly, (unlike the older children in the Facer *et al.*'s study, 2003) all of the children in this study did say that, at least for a while, they enjoyed using this particular edutainment CD ROM (*"I think you asked him, isn't this like school... he said, no, this is fun"*, Oliver's mother); some of them quickly become absorbed, within the flow (*"couldn't get him off it, you know he was really keen to go on it, spend a lot longer than he had to on it"*, Joe's mother); most of them (apart from Ben, who likes to keep school work and home very separate, protecting his leisure time, and Laura, who doesn't want her mother's *interference*) were happy to use CD ROM 2 at home (where time and access were less pressured, and where they had the support of a parent); and most of them did believe that they had learned something: for Lewis, some useful reading strategies and better keyboarding skills (in the 21st century, a skill not to be taken lightly); for Joe, improved listening skills; for Oliver, some spelling techniques; and for Laura, some comprehension skills. This isn't to suggest that the children *had* learned those skills, that is outside the scope of this study, but rather that they believed that they had (which might be at least the first stepping stone). Oliver was so pleased

with what he believed he had learned that he insisted on demonstrating for me (successfully as it happens) his new found skill using split vowel digraphs.

The dwindling interest, however, needs to be accounted for. Two reasons seem likely: firstly, because they played the games randomly, they frequently stumbled in games that were too difficult for them, leading to frustration; secondly, as a consequence, they preferred to repeat games that they found easy, but all too quickly these games became familiar and then boring. As suggested above, somehow, whether by guidance or by the programme, they need to be encouraged to play, until they have mastered, games that fit within their individual zone of proximal development.

When these children were happy to engage in the learning activities it was because they enjoyed the game approach; the graphics and animations (which they compared favourably, if a little kindly, with those of their games consoles); the challenges and beating their best times; the positive feedback (they enjoyed their successes, and it didn't matter if they made mistakes); and that they were having fun (CD ROM 2 prioritises play over authentic learning). Additionally, most of them said that they much preferred using the CD ROM to reading a book – it was more fun (more motivating) than school work. Nevertheless, and this was unexpected (albeit naïvely), all of the children in this study much preferred doing other things (trampoline acrobatics, street play, Lego, ballet...), rather than using the computer or computer games. For these children, unlike Prensky's digital natives, computer games simply aren't that important to them.

5.4 IN WHAT WAYS DID THE PARENTS BELIEVE THE CATCH UP CD ROM 2 TO BE BENEFICIAL?

“I think that anything that could be done at home has got to be a benefit.”
(Laura’s mother)

All of the parents spoke positively about CD ROM 2’s learning benefits (in particular, its positive, formative feedback – *cf.* Goyne, 2003). Everyone understood that the timescale was short, but most of them noted various ways in which they believed their child had learned something, for example, one or two of the reading and spelling strategies introduced in the games, or had gained (particularly Oliver) in self confidence.

They especially valued the quality of its design (which they believed to be important for motivation and learning by stealth – the only reason, they believed, the children willingly engaged with the reading and spelling activities at home): *“Because you’ve got it in a game format, he’s got that natural inquisitiveness to think, ‘oh, if I do that, what’s going to happen then’”* (Ben’s mother). They appreciated the fact that the design was appropriate for a child of their child’s age (although not, for Cate’s mother, for a child their child’s gender: *“It needs to be something that she can relate to a bit more”*) while the learning activities were at the ability level of younger children.

They enjoyed experiencing their children’s enjoyment and feelings of success; working together; discussing the learning; and, in particular, seeing what their child was able to achieve (something that most of them felt was lacking from their contact with school): *“It was good to see him listening, sounding it out and doing it”* (Joe’s mother). And they all valued the repeated practice (the drill and practice of which, at the start of the

study, I was somewhat cynical) – they all agreed that practice is an essential part of the learning process, especially for those who were struggling with reading (building towards making the reading of high frequency words automatic, to prepare for reading for meaning); and, in any case, they believed that the game competition, beating your best time, hid the game repetition (“*Joe can now see the differences in his times, which seems to push him on*”, Joe’s mother). In short, they were all happy that their child had had the opportunity to use the CD ROM: “*I would say it’s been a real plus in Oliver’s life*”, Oliver’s mother), and would be happy for them to continue using it (at least until they have completely lost interest).

What the parents didn’t like was the lack (as far as they were aware) of guidance; their (apparent) lack of control (over choosing and saving games); and the times when the games were clearly beyond the child’s capabilities. Integrating CD ROM 2 into family life was achieved with varying degrees of success. For many of the parents, the end of the summer term was simply the wrong time of year (personal experience suggests that homes with children are usually busy places at any time of the year) and CD ROM 2 lost out to other priorities (ballet shows or sports days): “*It wasn’t anything to do with your game, it’s was just sort of distractions of other things*” (Joe’s mother). For some, it was a question of access: “*I had in my mind that she had free access to the computer but in fact that isn’t the case at all*” (Laura’s mother). For others, even though for the purposes of the study they had been asked to use the CD ROM more frequently than the User Guide recommends, CD ROM 2 became a routine part of daily life – either as part of the child’s (sometimes scheduled) home learning activities, as an active alternative to television, or as a learning-rich virtual childminder.

5.5 WHAT MIGHT CATCH UP DO TO ENSURE THAT, WHEN USED AT HOME, CD ROM 2 EFFECTIVELY SUPPORTS CHILDREN'S LITERACY?

The pedagogical core of CD ROM 2 seems to be achieving what it sets out to achieve (it is consistent with the demands of the Catch Up Literacy curriculum – *cf.* Goyne, 2003), it provides enjoyable and effective drill and practice in key reading and spelling strategies for struggling readers, and most of the parents did believe that their child had made some learning gains. Nevertheless, as mentioned above, if parents are to be able to make best use of the available pedagogy, Catch Up need to consider the guidance that they provide – both in terms of its content, and of the way in which it is made available.

This guidance also needs to take account of the real and complicated (messy) context of the family home. There's little point advising against the use of CD ROM 2 as virtual childminder, for example, if that is the way it is going to be used in some households – instead, the challenge is to provide guidance that ensures that, when it is being used independently, it is as effective as it can be.

The guidance, as mentioned above, also needs to be more easily or obviously accessible; the printed User Guide doesn't seem to be the best route. A first step might be to make the User Guide directly available from the user interface; another possibility is some form of training, whether face-to-face or online (Jacqui Worsley argued that, in schools, training is needed to ensure that struggling readers get the most from the CD ROM and similar programmes). Alternatively, a technical approach might be used: incorporating the guidance (rather than the User Guide) directly into the games (*cf.* Gee's discussion of how the commercial game *Tomb Raider* teaches you how to play the game while you are playing the game, 2003: 114 *ff.*); or, perhaps, artificial

intelligence could be used to enable the CD ROM itself to determine the best game for the struggling reader to play or to adjust the level of difficulty according to the player's performance (*"I think the game should steer you"*, Lewis's mother), again as happens in many commercial digital games.

5.6 HOW MIGHT FUTURE DIGITAL GAMES FOR LEARNING BE INFORMED?

As producer of the Catch Up CD ROM 2, I am pleased by how it has been received (both in schools, by teachers and children, and now by parents). However, CD ROM 2 is limited by the fact that it is an essentially behaviourist learning resource which doesn't explore the possible benefits of constructivist, guided discovery or authentic approaches to learning. Nor does it exploit the affordances of artificial intelligence for digital games. Successful though the CD ROM 2 is in its own terms, this study has suggested to me a number of questions that warrant further investigation, the results of which could inform the development of future digital games for learning.

These questions concern:

- how the characteristics of what Prensky (2006: 57) calls 'complex' games – rules, goals and objectives, outcomes and feedback, conflict, competition, challenge, interaction, narrative, game play, and flow – can be applied effectively to games that aim to support learning
- authentic but endogenous learning (whilst CD ROM 2 does attempt to integrate the learning in the comprehension games with the world of the game, the

challenge is to integrate in a similar fashion the more technical spelling-skills games, to teach words in the context of meaning)

- the use of text to speech and voice recognition technologies: “*there was no chance for a word to be spoken, if you can’t read it or understand it*” (Lewis’s father) (cf. Rapid; Oakley, 2005; and Jeffs *et al.*, 2006)
- the possibility of mobile gaming to support struggling learners (enabling struggling learners to access digital games for learning on their telephones – cf. Naismith *et al.*, 2004)
- artificial intelligence in digital games (guiding the learner through constructivist tasks that are proportionate to their abilities, that are in their ZPD (‘a computer tool can serve as a “more capable peer” (...) in a learner’s zone of proximal development and can thus facilitate the development of competency’, Saloman *et al.*, 1989: 625) – perhaps even generating content on the fly according to the needs of the individual learner.

CHAPTER SIX

Conclusions

“You want to be involved in his learning. If you’ve got software that’s guiding the parent (...) and it’s all happening, you can’t go wrong really.”
(Lewis’s mother)

This study set out to evaluate how the Catch Up CD ROM 2 might be used at home, by parents to support their own children’s literacy, and it has shown that, under particular circumstances, CD ROM 2 can make a positive contribution to learning. In fact, the overarching research question has been answered in the affirmative: Catch Up CD ROM 2 *can* be used effectively by (some) parents at home. However, as (logically) only one successful family was needed to prove the point, this answer is a superficial response to the study’s intent. More interesting is what has been learned about the ways in which the CD ROM has been used: what has been its benefits, what have been the difficulties, and in what ways can it (and future such resources) be made more effective.

Firstly, this study reaffirms that digital games are unlikely to be, despite the confident claims of their loudest advocates (*cf.* Prensky, 2001 & 2006), a learning panacea: if only because not all children are avid computer gamers. Whilst all of the children in this study preferred playing the CD ROM 2 to reading books, all of them preferred doing other things instead (from ballet dancing to acrobatics on the trampoline).

Nevertheless, the fact that all of the children did enjoy (for a while) playing the CD ROM 2, and that they and their parents believed that they had learned (albeit by stealth) from doing so (whether skills with digraphs, self-confidence or keyboard skills), suggests that the fun and motivational affordances of digital computer games like CD ROM 2 can be important for those children who elsewhere struggle with learning (motivating children who constantly experience failure to re-engage with learning is particularly worthwhile). For the developers of such software, a key challenge is ‘to get the correct balance between delightful play and fulfilling specified learning outcomes’ (de Freitas, 2006: 5).

For the parents, the CD ROM 2 fulfilled (briefly) a range of functions, all of them valuable within the context of the family home: it enabled them to support their children’s learning in a way that was pedagogically sound; it enabled them to participate directly in their children’s learning (playing the CD ROM 2 together with their parents was, for most of the children, key to their enjoyment, learning and achievement); it enabled them to find out directly about their children’s literacy abilities (rather than having to rely entirely on school); and it (occasionally) provided them with a virtual childminder (although having the children play independently did in any case promote the children’s self-confidence).

Where the CD ROM 2 was not so successful was in ensuring that the children only experienced games within their ZPD, challenging but doable. Instead, as has been described, the children often repeated games that they found easy, until they lost interest, or attempted games that were beyond their capabilities, then failed and gave up. With this in mind, if the CD ROM 2 is going to be made available to parents, making it

more proactive, so that parents don't have to take on the responsibilities of an expert reading teacher, whilst ensuring that parents receive and take on board appropriate guidance, are key challenges for Catch Up.

Where, for me, this study has been most valuable is in the many intriguing questions it has raised, further consideration of which will usefully inform the development of future digital games that provide stimulating environments for learning. In fact, although most edutainment games might be lacking and not all younger children prioritise gaming, this study has led me to believe that the potential for digital games for learning (motivation and effectiveness), particularly for those children who are struggling to make progress, is immense: 'frankly, most existing edutainment products combine the entertainment value of a bad lecture with the educational value of a bad game. But what if we could turn that around?' (Squire & Jenkins, 2003: 8).

September 2008

REFERENCES

- Abbot, C. (2007) *Report 15: E-inclusion: Learning Difficulties and Digital Technologies*, FutureLab [retrieved from http://www.futurelab.org.uk/resources/documents/lit_reviews/Learning_Difficulties_Review2.pdf, August 18, 2008]
- Adey, P. & Shayer, M. (1994) *Really Raising Standards – Cognitive intervention and academic achievement* (London, Routledge)
- Adey, P., Robertson, A. & Venville, G. (1998) *Let's Think! GL Assessment*: <http://shop.nfer-nelson.co.uk/icat/4043102main>
- Atkinson, P. (2005) *Qualitative Research—Unity and Diversity*. Forum: Qualitative Social Research, 6, 3, 26 [retrieved from <http://www.qualitative-research.net/fqs/>, August 28, 2008]
- Baker, L. (2003) *The role of parents in motivating struggling readers*. Reading & Writing Quarterly, 19, 87-106
- BECTA (2001) *Computer Games in Education project: Aspects* [retrieved from <http://partners.becta.org.uk/index.php?section=rh&catcode=&rid=13588&pagenum=6&NextStart=1>, August 28, 2008)
- BECTA (2007) *Research report: Harnessing Technology Review 2007: Progress and impact of technology in education* [retrieved from <http://publications.becta.org.uk/display.cfm?resID=33979&page=1835>, June 15, 2008)
- Bennett, S., Maton, K. & Kervin, L. (2008) *The 'digital natives' debate: A critical review of the evidence*. British Journal of Educational Technology, 39, 5, 775-786
- Berliner, D. C. (2002) *Educational Research: The Hardest Science of All*. Educational Researcher, 31, 8, 18-20
- Birmingham, P. & Davies, C. (2001) *Storyboarding Shakespeare: learners' interactions with storyboard software in the process of understanding difficult literary texts*. Journal of Information Technology for Teacher Education, 10, 3, 2001
- Black, P. & Wiliam, D. (1998) *Inside the Black Box* (London, nferNelson)
- British Education Index: accessed via <http://www.bodley.ox.ac.uk/oxlip>
- Brooks, G. (2007) *What works for pupils with literacy difficulties? The effectiveness of intervention schemes*. (Department for Children, Schools and Families, ref: 00688-2007BKT-EN). <http://www.standards.dcsf.gov.uk> [retrieved January 22, 2008]
- Brown, A. & Davis, N. (2004) *Digital Technology, Communities and Education* (Routledge)

- Buckingham, D. & Scanlon, M. (2003) *Education, Entertainment and Learning in the Home* (Buckingham, Open University Press)
- Byron, T. (2008) *Safer Children in a Digital World*. The Department for Children, Schools and Families, and the Department for Culture, Media and Sport. [Retrieved from <http://www.dcsf.gov.uk/byronreview>, 28 April 2008]
- Catch Up: <http://www.catchup.org.uk>
- Catch Up (2007a) *Catch Up and the renewed Primary Framework for Literacy* published on the Catch Up website
- Catch Up (2007b) *Catch Up Literacy file*, see 'Catch Up'
- Catch Up CD ROM 2 User Guide (2003), see 'Catch Up'
- Chall, J. (1976) *The Great Debate: Ten Years Later, with a Modest Proposal for Reading Stages*, paper presented at the Conference on Theory and Practice of Beginning Reading Instruction, University of Pittsburgh [retrieved from http://eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/35/bc/3c.pdf, August 22, 2008]
- Clarke, A. (1999) *Evaluation Research: An Introduction to Principles, Methods and Practice* (London, Sage)
- Comber, C., Watling, R., Lawson, T., Cavendish, S., McEune, R. & Paterson, F. (2002) *ImpaCT2: Learning at Home and School: Case Studies*. Produced by Becta for the Department for Education and Skills.
- Coyne, I. T. (1996) *Sampling in qualitative research. Purposeful and theoretical sampling; merging or clear boundaries?* Journal of Advanced Nursing, 26, 623-630.
- Crawford, C. (1982) *The Art of Computer Game Design* [electronic version, retrieved from <http://www.stanford.edu/class/sts145/Library/Crawford%20on%20Game%20Design.pdf>, August 28, 2008]
- Crotty, M. (1998) *The foundations of social research: meaning and perspective* (London, Sage)
- Csikszentmihalyi, M. (1990) *Flow: The Psychology of Optimal Experience* (Cambridge University Press)
- Csikszentmihalyi, M. (1996) *Creativity: Flow and the psychology of discovery and invention* (New York, Harper Collins)
- Curtis, S., Gesler, W., Smith, G. & Washburn, S. (2000) *Approaches to sampling and case selection in qualitative research: examples in the geography of health*. Social Science & Medicine, 50, 1001-1014.

- DCSF (2008) *Home Access to Technology: Consultation* [retrieved from <http://www.dcsf.gov.uk/consultations>, August 21, 2008]
- de Freitas, S. (2006) *Learning in Immersive worlds – A review of game-based learning. JISC e-Learning Programme* [retrieved from http://www.jisc.org.uk/media/documents/programmes/elearninginnovation/gamingreport_v3.pdf, August 20, 2008]
- Denzin, N. K. & Lincoln, Y. S. (2005) *The Sage Handbook of Qualitative Research (Third edition)* (Thousand Oaks, Sage)
- Desforges, C. & Abouchar, A. (2003) *The Impact of Parental Involvement, Parental Support and Family Education on Pupil Achievements and Adjustment: A Literature Review*, Department for Education and Skills, Research report RR433 [retrieved from <http://www.dcsf.gov.uk/research/data/uploadfiles/RR433.pdf>, August 18, 2008]
- DfES (2002) *Young People and ICT Survey 2002* [retrieved from <http://publications.teachernet.gov.uk/default.aspx?PageFunction=productdetails&PageMode=publications&ProductId=DfES+0789+2002&>, September 2, 2008]
- Durkin, K. & Barber, B (2002) *Not so doomed: computer game play and positive adolescent development. Applied Developmental Psychology*, 23, 373-392
- Educational Resources Information Center (ERIC): accessed via <http://www.bodley.ox.ac.uk/oxlip>
- Egenfeldt-Nielsen, S. (2006) *Overview of research on the educational use of video games. Digital Kompetanse*, 3, 1, 184-213
- Egenfeldt-Nielsen, S., Heide Smith, J. & Pajares Tosca, S. (2008) *Understanding Video Games* (New York, Routledge)
- ELT (undated), *Embedding Learning Technologies Evaluation Guide*, <http://www.elt.ac.uk/ELT%20documents/materials/evalguide.pdf> [retrieved December 15, 2007]
- EUN (*Games in Schools – a study for the Interactive Software Federation of Europe*): <http://blog.eun.org/games/>
- Facer, K. & Furlong, R. (2001) *Beyond the Myth of the 'Cyberkid': Young People at the Margins of the Information Revolution. Journal of Youth Studies*, 4, 4, 451-469
- Facer, K., Furlong, J., Furlong, R. and Sutherland, R. (2003a) *ScreenPlay: Children and Computing in the Home* (London, RoutledgeFalmer)

- Facer, K., Furlong, J., Furlong, R. and Sutherland, R. (2003b) 'Edutainment' software: a site for cultures in conflict? in Sutherland, R., Claxton, G. & Pollard, A. Learning and Teaching Where Worldviews Meet (Stoke on Trent, Trentham)
- Farné, R. (2005) *Pedagogy of Play*. Topoi, 24, 169-181
- Gadamer, H-G. (1960) *Warheit und Methode, Grundzüge einer philosophischen Hermeneutik (Truth and Method, Outline for a Philosophical Hermeneutics)*, translated by Weinsheimer, J. & Marshall, D. G. (London, Continuum, 2004)
- Galarneau (2005) *Authentic Learning Experiences Through Play: Games, Simulations and the Construction of Knowledge*. Proceedings of DiGRA 2005 Conference: Changing Views – Worlds in Play
- Gee, J. P. (2003) *What Video Games have to Teach us about Learning and Literacy* (New York, Palgrave Macmillan)
- Gomm, R., Hammersley, M. & Foster, P. (2000) *Case Study and Generalisation in* Gomm, R. Case Study Method: Key Texts. (London: Sage)
- Google: <http://www.google.com>
- Google Scholar: <http://scholar.google.com>
- Gorard, S. (2001) *Quantitative Methods in Educational Research. The Role of Numbers Made Easy*. (London, Continuum)
- Goyne, J. S., McDonough, S. K. & Padgett, D. D. (2000) *Practical Guidelines for Evaluating Educational Software*, The Clearing House, 73, 6, 345-348
- Greenfield, P. M. (1984) *Mind and Media: The effects of television, computers and video games* (Harvard University Press)
- Grisham, D. L. & Wolsey, D. T. (2008) *The Role of Technology in Supporting Struggling Readers* in Lenski, S. D. & Lewis, J. Reading Success for Struggling Adolescent Learners (New York, Guilford Press)
- Gunter, B. (1998) *The Effects of Video Games on Children* (Sheffield, Continuum)
- Hannon, P. (1995) *Literacy, Home, and School: Research and Practice in Teaching Literacy with Parents* (London, Routledge)
- Harvey, J. (ed.) (1998) *LTDI Evaluation Cookbook*. (Edinburgh, Learning Technology Dissemination Initiative)
- Herrington, J., Oliver, R. & Reeves, T. C. (2002) *Patterns of engagement in authentic online learning environments*. Paper presented at ASCILITE 2002 [retrieved from <http://www.ascilite.org.au/conferences/auckland02/proceedings/papers/085.pdf>, August 22, 2008]

- Hoepfl, M. C. (1997) *Choosing Qualitative Research: A Primer for Technology Education Researchers*. Journal of Technology Education, 9, 1, 47-63
- Hsi, S. (2007) *Conceptualizing Learning from the Everyday Activities of Digital Kids*. International Journal of Science Education, 29, 12, 1509-1529
- Jackson, B. (1998) *Evaluation of Learning Technology Implementation*. LTDI: Evaluation Studies, 22-25 [retrieved from <http://www.icbl.hw.ac.uk/ltidi/evalstudies/esevalimp.pdf>, March 7, 2008]
- Jarvis, P., Holford, J. & Griffin, C. (1998) *The theory and practice of learning* (London, RoutledgeFalmer)
- Kent, N. & Facer, K. (2004) *Different worlds? A comparison of young people's home and school ICT use*. Journal of Computer Assisted Learning, 20, 440-455
- Kirriemuir, J. (2002) *Video Gaming, Education and Digital Learning Technologies: Relevance and Opportunities*. D-Lib Magazine, 8, 2 [retrieved from <http://www.webdoc.sub.gwdg.de/edoc/aw/d-lib/dlib/february02/kirriemuir.html>, July 24, 2008]
- Kirriemuir, J. & McFarlane, A. (2006) *Report 8: Literature Review in Games and Learning*. FutureLab [retrieved from http://www.futurelab.org.uk/resources/documents/lit_reviews/Games_Review.pdf, August 18, 2008]
- Kreber, C., Brook, P. & Educational Policy (2001) *Impact evaluation of educational development programmes*. International Journal for Academic Development, 6, 2, 96-108
- Laurillard, D. (1995) *Multimedia and the changing experience of the learner*. British Journal of Educational Technology, 26, 3, 179-189
- Locke, J. (1692) *Some Thoughts Concerning Education*, Modern History Sourcebook [retrieved from <http://www.fordham.edu/halsall/mod/1692locke-education.html>, July 10, 2008]
- Luik, P. (2006) *Characteristics of drills related to development of skills*. Journal of Computer Assisted Learning, 23, 56-68
- Malterud, K. (2000) *Qualitative research: standards, challenges, and guidelines*. Lancet, 358, 483-88.
- Marton, F., & Säljö, R. (1997) *Approaches to Learning* in Marton, F.; Hounsell, D., & Entwistle, N. (eds) The Experience of Learning. (Edinburgh, Scottish Academic Press)
- Maxwell, J. (2002) *Understanding and validity in qualitative research* in Huberman, A. & Miles, M. (eds) The qualitative researcher's companion (Thousand Oaks, Sage)

- Mayer, R. E. (2004) *Should there be a Three-Strikes Rule against Pure Discovery Learning? The Case for Guided Methods of Instruction*. American Psychologist, 59, 1, 14-19
- McFarlane, A., Sparrowhawk, A. & Heald, Y. (2002) *Report on the educational use of games*. TEEM/DfES [retrieved from http://www.teem.org.uk/publications/teem_gamesined_full.pdf, August 25, 2008]
- Miles, M. B. & Huberman, A. M. (1994) *Qualitative Data Analysis* (Thousand Oaks, Sage)
- MIT (2003) *Games to Teach* [retrieved from <http://icampus.mit.edu/projects/GamesToTeach.shtml>, August 28th 2008]
- Naismith, L., Lonsdale, P., Vavoula, G. & Sharples, M. (2004) Mobile technologies and learning. FutureLab [retrieved from http://www.futurelab.org.uk/resources/documents/lit_reviews/Mobile_Review.pdf, August 24, 2008]
- Nation, K. & Angell, P. (2006) *Learning to read and learning to comprehend*. London Review of Education, 4, 1, 77-87
- National Statistics (1991) *Norfolk – Ethnic group of residents*, [retrieved from <http://www.statistics.gov.uk/statbase/xsdataset.asp?More=Y>, August 18, 2008]
- National Statistics (2008) *Neighbourhood Statistics*, [retrieved from <http://www.neighbourhood.statistics.gov.uk/dissemination/>, August 18, 2008]
- Nessy (*Nessy Learning Programme*): <http://www.nessy.co.uk>
- Oakley, G. (2005) *Helping parents assist their struggling literacy learners: Using ICT in the home*. Making Meaning: Creating Connections that Value Diversity, proceedings of the 30th National Conference of the Australian Association of Special Education, 138-143
- OFCOM (2008) *The Communications Market 2008 (August)* [retrieved from <http://www.ofcom.org.uk/research/cm/cmr08>, September 1, 2008]
- Oliver, M. (2000) *An introduction to the Evaluation of Learning Technology*. Educational Technology & Society, 2, 4, 20-30
- Oliver, M. & Conole, G. (1998) *Evaluating Learning Technology: a toolkit for practitioners*. Active Learning, 8, 3-8
- ONS (2006) *UK Snapshot: Consumer durables, Expenditure and Food Survey*, Office for National Statistics [retrieved from <http://www.statistics.gov.uk/cci/nugget.asp?id=868>, September 1, 2008]
- Papert, S. (1993) *Mindstorms – Children, Computers and Powerful Ideas* (New York, Basic Books)

- Patton, M. Q. (1996) *Utilization-Focused Evaluation: The New Century Text* (London, Sage)
- Peters, M., Seeds, K., Goldstein, A. & Coleman, N. (2007) *Parental Involvement in Children's Education 2007, BRMB Social Research, Department for Children, Schools and Families*, Research report DCSF-RR034 [retrieved from <http://www.dcsf.gov.uk/research/data/uploadfiles/DCSF-RR034.pdf>, August 18, 2008]
- PEW (2008) *Pew Internet and American Life Project: Teens, Video Games, and Civics* [retrieved from http://www.pewinternet.org/pdfs/PIP_Teens_Games_and_Civics_Report_FINAL.pdf, September 16, 2008]
- Prensky, M. (2001) *Digital Game-Based Learning* (St. Paul MN, Paragon House)
- Prensky, M. (2006) *Don't Bother Me Mom – I'm Learning* (St. Paul MN, Paragon House)
- Punch, K. (2005) *Introduction to Social Research: Quantitative and Qualitative Approaches, Second Edition* (London, Sage Publications)
- Rapid (*Soliloquy Reading Assistant*): <http://www.heinemann.co.uk/Series/Primary/Rapid/Software/Software.aspx>
- Ravenscroft, A. (2001) *Designing E-learning Interactions in the 21st Century: revisiting and rethinking the role of theory*. *European Journal of Education*, 36, 2, 133-156
- Reynolds, J. (2005) *Parents' Involvement in their Children's learning and schools*. *Family & Parenting Institute*, policy discussion paper.
- Ross, M. (2008) *The Multiplier Effect in Teaching* (Cardiff, Michael Ross Consultancy)
- Salomon, G. (1991) *Transcending the Qualitative-Quantitative Debate: The Analytic and Systemic Approaches to Educational Research*. *Educational Researcher*, 20, 6, 10-18.
- Salomon, G., Globerson, T. & Guterman, E. (1989) *The Computer as a Zone of Proximal Development: Internalizing Reading-Related Metacognitions From a Reading Partner*. *Journal of Educational Psychology*, 81, 4, 620-627
- Sanger, J., Wilson, J., Davies, B. & Whittaker, R. (1997) *Young Children, Videos and Computer Games* (London, Routledge)
- Schleiermacher, F. (1819) *General Hermeneutics*; translated by J. Duke and J. Forstman, in Mueller-Vollmer (ed.) (1986), *The Hermeneutics Reader* (Oxford, Basil Blackwell)
- SCOPUS: accessed via <http://www.bodley.ox.ac.uk/oxlip>

- Scott, J. & Marshall, G. (2005) *Qualitative versus quantitative debate*. A Dictionary of Sociology [retrieved from <http://www.oxfordreference.com/views/ENTRY.html?subview=Main&entry=t88.e184>, retrieved March 2, 2008].
- Sefton-Green, J. (2006) *Report 7: Literature Review in Informal Learning with Technology Outside School*, FutureLab [retrieved from http://www.futurelab.org.uk/resources/documents/lit_reviews/Informal_Learning_Review.pdf, April 28, 2008]
- Shaffer, D. W. (2006) *How Computer Games Help Children Learn* (New York, Palgrave Macmillan)
- Silverman, D. (2004) *Doing Qualitative Research: A Practical Handbook (second edition)* (Thousand Oaks, Sage)
- Squire, K. (undated) *Video Games in Education* [retrieved from <http://www.????pdf>, April 28, 2008]
- Squire, K. & Jenkins, H. (2003) *Harnessing the power of games in education*. Vision, 3, 7-31
- Stake, R. E. (1978) *The Case Study Method in Social Inquiry*. Educational Researcher, 7, 5-8
- Stake, R. E. (1988) *Case study methods in education research: seeking sweet water in* Jaeger, R. M. (ed.) Complementary Methods for Research in Education (Washington, American Educational Research Association);
- Stake, R. E. (2000a) *The Case Study Method in Social Inquiry* in Gomm, R., Hammersley, M. & Foster, P. Case Study method: Key Issues, Key Texts (London, Sage)
- Stake, R. E. (2000b) *Qualitative Case Studies* in Denzin, N. K. & Lincoln Y. S. The Sage Handbook of Qualitative Research (Third edition) (Thousand Oaks, Sage)
- Stiles, W. B. (1993) *Quality Control in Qualitative Research*. Clinical Psychology Review, 13, 593-618
- Strommen, E. F. & Lincoln, B. (1992) *Constructivism, technology and the future of classroom learning*. Education and Urban Society, 24, 4, 466-476
- Sylva, K., Scott, S., Totsika, V., Ereky-Stevens, K. & Crook, C. (2008) *Training parents to help their children read: A randomised control trial*. British Journal of Educational Psychology, 78, 3, 435-455
- Tapscott, D. (1998) *Growing Up Digital: The Rise of the Net Generation*. Meridian: Middle School Technologies Journal, 1, 1, 1-12

- Tizard, J., Schofield, W. & Hewison, J. (2002) *Collaboration between teachers and parents in assisting children's reading* in Reid, G., Wearmouth, J. & Soler, J. (eds) Addressing Difficulties in Literacy Development: Responses at Family, School, Pupil and Teacher Levels (London, RoutledgeFalmer)
- Topping, K. J. (1997) *Electronic Literacy in School and Home: A Look into the Future. Reading Online* [retrieved from http://www.readingonline.org/international/inter_index.asp?HREF=future/index.html, September 1, 2008)
- Turkle, S. (2005, first published 1984) *The Second Self: Computers and the Human Spirit, Twentieth Anniversary Edition* (MIT Press)
- Vasilyeva, E., Puuronen, S., Pechenizkiy, M. & Rasanen, P. (2007) *Feedback adaptation in web-based learning systems. International Journal of Continuing Engineering Education and Life Long Learning*, 17, 4-5, 337 - 357
- Vygotsky, L. (1930) *Mind in Society* (Cambridge, Harvard University Press) [retrieved from <http://www.marxists.org/archive/vygotsky/works/mind/chap6.htm>, August 24, 2008]
- Vygotsky, L. (1933) *Play and its role in the Mental Development of the Child* [retrieved from <http://www.marxists.org/archive/vygotsky/works/1933/play.htm>, August 24, 2008]
- Wellington, J. (2001) *Exploring the Secret Garden: the growing importance of ICT in the home. British Journal of Educational Technology*, 32, 2, 233-244
- Whitehead, L. (2003) *Enhancing the quality of hermeneutic research: decision trail. Journal of Advanced Nursing*, 45, 5, 512-518
- Williams, B., Williams, J. & Ullman, A. (2002) *Parental Involvement in Education, BRMB Social Research, Department for Education and Skills*, Research report RR332 [retrieved from <http://www.dcsf.gov.uk/research/data/uploadfiles/RR332.pdf>, August 18, 2008]
- Yahoo: <http://uk.yahoo.com>
- Yin, K. (2003) *Case Study Research: Design and Methods (Third Edition)* (Sage)

APPENDICES

- i Participant information
- ii Start of study interview questions (parents and children)
- iii End of study interview questions (parents and children)
- iv Jacqui Worsley interview questions
- v Log sheet
- vi Time spent using the CD ROM 2 (summary of the numerical information entered onto the log sheets)
- vii Time spent using the CD ROM 2 (details)
- viii Selection of comments entered onto the log sheet

Appendix i: Participant information



DEPARTMENT OF EDUCATION
15 Norham Gardens, Oxford, OX2 6PY
Tel: +44(0)1865 274024
Fax: +44(0)1865 274027
general.enquiries@education.ox.ac.uk
www.education.ox.ac.uk

Evaluating the use of the Catch Up CD ROM 2 in a home environment – a research study.

Information for family participants

Invitation

You are being invited to take part in a research study. Before you agree to take part, it is important that you understand the purpose of the research and what your participation will involve. This document aims to give you all the information that you need to make an informed decision. Please take all the time that you need to read it. Please don't hesitate to ask if there is anything about the project that is unclear or if you would like more information. Please take all the time that you need to decide whether or not you would like to take part in this research.

What is the purpose of the study?

This study is an evaluation of the Catch Up CD ROM 2 in a home environment. The Catch Up CD ROM 2 has been designed for use by school staff with learners who need additional literacy support. The aim of the study is to find out if the CD ROM 2 can be used successfully by parents with their own children, and what Catch Up might need to do to provide effective support for parents who are using the CD ROM.

Why have you been chosen?

For this study, I am hoping to work with a range of families, and your name has been suggested by the Norfolk Educational Psychology and Specialist Support Service as someone who might be interested in using the Catch Up CD ROM with your child. By working with a range of families, I will be able to find out about a full range of experiences which will enable me to properly evaluate the CD ROM.

What will your participation involve?

The research project will last approximately 3 weeks. I would hope to visit you at your family home three times during this period: at the beginning, at the start, and at the end. On my first visit, I will give you a copy of the Catch Up CD ROM 2 and will help you install it onto your computer. I will then ask you and your child to 'play' the CD ROM for 10-15 minutes once a day, whenever possible, and to keep a brief record of the times that you do use it. At each of my visits, I would like to ask you and your child some questions about your child and about your experience of using the CD ROM. I will be particularly interested in your opinions of how effective the CD ROM is in helping you to support your child's literacy.

Do you have to take part?

No. It is entirely your decision to take part in this study, and you can decide to stop participating at any time. In addition, you and your child do not need to answer any questions that you do not wish to answer.

What are the risks and benefits of taking part?

There are no known risks to your participation in this study. You and your child can withdraw from the study at any time. Your child will only be questioned and their use of the CD ROM observed under your strict supervision (i.e. with you present in the room at all times).

The research information gathered during this study will only be made available to my supervisor, Dr Chris Davies, and Catch Up. In any reports, all names will be anonymised and every effort will be taken to protect the identity of the participants

In addition to contributing to my MSc, the study will benefit Catch Up, helping them to understand how the CD ROM can be used help parents support their children's literacy. Eventually, in turn, this will benefit other parents and children.

What will happen to the results of this research?

The results of this research will form the basis of my MSc dissertation, which will be submitted for assessment to the University of Oxford at the end of September 2008. If you would like to have a copy of the dissertation, please let me know.

Who is funding and organising the research?

The research is funded and organised as an independent MSc research project in conjunction with the University of Oxford's Department of Education and Catch Up (a not-for-profit charity).

Contact for further information or follow-up

Should you have any further questions about this research study, please do not hesitate to contact me:

- [_____](#)
Department of Education, University of Oxford, 15 Norham Gardens,
Oxford, OX2 6PY

Alternatively, you can contact my MSc Supervisor:

- Dr Chris Davies (chris.davies@education.ox.ac.uk), Department of Education, University of Oxford, 15 Norham Gardens, Oxford, OX2 6PY (01865 274024)

Or you can contact the Director of Catch Up:

- Julie Lawes (julie@catchup.org.uk), Catch Up, Keystone Innovation Centre, Croxton Way, Thetford, IP24 1JD (01842 752297)

THANK YOU FOR TAKING THE TIME TO READ THIS INFORMATION

Appendix ii: Start of study interview questions

PARENTS

- Tell me about (your child) and their literacy skills (at home and at school)
- Why have you agreed to take part in this project, what do you hope it will achieve for (your child)?
- Why are reading skills important to (your child)?
- How is the computer used in your family?
- How do you think this computer programme might help (your child)?
- How much time does (your child) spend using the computer? Is this too little or too much?
- What do they enjoy doing on the computer?

CHILDREN

- Do you like reading?
- Do you like reading best at home or at school?
- Do you like using a computer?
- What kind of things do you like to do on a computer?
- How much time do you spend using a computer?

Appendix iii: End of study interview questions

PARENTS

1. Tell me about how it's been going
2. How did you fit it into family life?
3. Any technical problems?
4. Any other problems?
5. Did you sit with them, or let them get on with it?
6. Did you do the games in any particular order?
7. How important were the pictures and storylines?
8. What do you think about the drill and practice?
9. Compared with XBox/Nintendo type games, this one is quite simple. Do you think it's necessary to have the more sophisticated game styles to make learning effective?
10. Was the User Guide of any use to you?
11. What progress have they made?
12. Have you looked at the scores?
13. What do you think they have learned?
14. Would you have been willing and able to purchase the CD?
15. What would you say to a parent in a similar situation to you about the CD?
16. What should we do to make the CD better?
17. What's the benefits for them, having the CD at home rather than at school?
18. Any final comment?

CHILDREN

1. Have you enjoyed using the CD?
2. What's been your favourite World?
3. Tell me about the story in the world
4. Is the story important?
5. Were the stories easy to understand or were they sometimes confusing?
6. What do you think about being asked to repeat the same task several times?
7. Tell me about the pictures and animations
8. Do you play other computer games, how do they compare?
9. Did you find it easy to learn how to play the games, or was it sometimes confusing?
10. What do you think you've learned?
11. What should we do to make the CD better?
12. How does playing the CD compare with learning in school?
13. Did you like having the CD at home, or would you have preferred it at school?
14. What would you say about the CD to other children who find reading a bit difficult?
15. Any final comment?

Appendix iv: Jacqui Worsley interview questions

JACQUI WORSLEY

1. Would you tell me about the part of your job that leads you to work with the families I've been working with?
2. Why did you suggest each of the families?
3. In which NRS social grouping would you put each family?
4. Would you tell me about how, in your experience, parents in general are, or want to be, involved in their children's learning: the benefits and problems?
5. Would you tell me about the part of your job that is concerned with multimedia?
6. Are you familiar with the Catch Up CD ROM 2? If so, what do you think are its strengths and weaknesses?
7. What did you expect to be the benefits of using the Catch Up CD ROM 2 in family homes?
8. Would you tell me about how, in your experience, multimedia is used in schools?
9. What criteria do you use when suggesting particular software for schools and for families?
10. Which software do you find yourself recommending/suggesting most often?

Appendix v: Log sheet

Family name:

EVALUATING THE USE OF THE CATCH UP CD ROM 2 IN A HOME ENVIRONMENT

date	date	start time	end time	game	comments (if any)
Tuesday	1 July				
Wednesday	2 July				
Thursday	3 July				
Friday	4 July				
Saturday	5 July				
Sunday	6 July				
Monday	7 July				
Tuesday	8 July				
Wednesday	9 July				

Appendix vi: Time spent using the CD ROM 2 (summary of the numerical information entered into the log sheets)

	OLIVER	CATE	LEWIS	BEN *	LAURA	JOE
No. of days	23	24	24	51	16	23
No. of TIMES PLAYED	14	6	11	<i>c. 30</i>	7	20
TOTAL MINUTES	340	139	255	-	115	355
Mean (minutes)	24	23	23	<i>c. 10</i>	16	18
Median (minutes)	25	25	20	-	15	15
Mode (minutes)	30	25	20	-	10	15
Shortest time (minutes)	10	14	40	-	10	10
Longest time (minutes)	30	30	10	<i>c. 20</i>	25	30

* As Ben's log sheet was not returned, the figures given for Ben are as reported by his mother during her second interview.

Appendix vii: Time spent using the CD ROM 2 (details)

	OLIVER			CATE			LEWIS			BEN			LAURA			JOE		
	Start	End	Duration	Start	End	Duration	Start	End	Duration	Start	End	Duration	Start	End	Duration	Start	End	Duration
Mon				16:20	16:45	25	19:00	20:20	20							18:30	19:00	30
Tue	06:45	07:05	20													17:40	18:00	20
	16:45	17:15	30															
Wed	16:45	17:15	30	16:00	16:20	20	19:00	19:40	40							19:10	19:25	15
Thu	17:00	17:30	30				19:00	19:30	30							18:10	18:30	20
Fri	17:00	17:30	30													17:25	17:50	25
Sat							10:45	11:05	20							10:10	10:25	15
Sun							19:00	19:20	20							10:00	10:15	15
Mon	12:45	13:15	30	16:10	16:35	25	19:20	19:45	25							17:20	17:40	20
Tue													16:50	17:15	25	18:10	18:20	10
Wed				05:50	06:04	14	19:15	19:45	30				19:00	19:10	10	18:05	18:20	15
Thu	16:50	17:15	25				19:00	19:20	20				18:55	19:15	20	18:10	18:25	15
Fri																17:15	17:30	15
Sat													15:15	15:30	15	14:05	14:30	25
Sun				13:30	13:55	25	19:00	19:20	20				12:50	13:00	10	10:10	10:20	10
Mon	16:45	17:10	25				20:00	20:10	10				19:30	19:50	20	16:50	17:10	20
Tue	17:30	17:45	15													19:50	20:10	20
Wed	17:20	17:30	10	15:35	16:05	30	19:15	19:35	20							20:50	21:10	20
Thu	16:45	17:15	30										19:35	19:50	15	17:05	17:20	15
Fri	18:40	19:00	20															
Sat	18:20	18:45	25													10:05	10:20	15
Sun	18:40	19:00	20													18:10	18:25	15

As the log sheet was not returned, there are no times logged for Ben.

Appendix viii: Selection of comments entered onto the log sheets

OLIVER

“Oliver is very happy with himself, because he beat his times on all three games.”

“Oliver likes to look at the log book, to see how he is doing.”

CATE

“Cate found this quite hard.” (The Tomb of King Heb)

LEWIS

“Would like ability for story to be read.”

“Loves baby hatching and feeding.” (Land of the Dinosaurs)

BEN

(Log sheet not returned)

LAURA

“Laura didn’t want to do it tonight – said she had finished all games.”

JOE

“Pictures look great. Keeps him interested in story.”

“Joe can now see the differences in his times, which seems to push him on.”