Developing reflective engagement in the use of online digital devices:

A multiple case study of seven year olds and their home-school contexts

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I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

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Abstract

Children in the UK today live in an increasingly mediatised world. With rapid evolution in mobile technologies they are faced from an increasingly young age with a plurality of choices at the level of device, mode and platform. Research argues that this landscape can offer exciting and empowering ways for children to learn, socialise and create, but that it also poses challenges in terms of wellbeing and relationships with information. Understanding how to support children to engage with devices healthily, critically and constructively has therefore attracted research attention across a number of disciplines from media education and online safety through information behaviour to new literacies. In some respects this has led to a proliferation and fragmentation of 'literacies' that can be overwhelming to navigate. However, bringing them into dialogue it is possible to find some common ground around what reflective engagement might look like. There is also agreement across these disciplines that in order to develop responsive ways of encouraging and supporting reflective engagement more research attention needs to be paid to the messy realities of children's situated practices. Bringing this bottom-up research into dialogue with a tentative definition of reflective engagement based on existing models and ideas from the literature was the aim of the present study.

The study was initially informed by learning ecology perspectives that situate children's practices within a set of different contexts. Using this as a heuristic framing device the study explored the shaping of children's engagement through a number of different lenses: material, socio-emotional, pedagogical and cultural. Using a case study approach I spent time with seven children, their families and their peers across home and school settings. In so doing I sought to generate rich qualitative data about practices, the aspects of context shaping them and the emergent understanding and reflection arising around them from both children's and adults' perspectives. Thematic analysis of this data brought insights that built on the tentative characterisation of reflective engagement I began with. However, the findings also revealed some challenges and 'entry points' in terms of reflective engagement that hadn't been anticipated. Synthesising these entry points under the notions of practices, spaces,

resources and roles I shifted gear from exploratory to pragmatic and adopted the over-arching concept of 'sponsors' of reflective engagement as way of moving forward. The thesis concludes with the suggestion that identifying or creating 'sponsors of reflective engagement' could be a dynamic and constructive way of mobilising the assets and addressing the needs of a primary school community.

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Acknowledgments

Introduction

As an introduction to the research presented in this thesis I will briefly tell it as a personal story: how it grew out of my lived experience of wider social trends and a pragmatic desire to actively shape the world with my children and their contemporaries, how it was shaped by immersion in big ideas that left small traces, how I detoured into different disciplines and got lost several times and how I ultimately came back to my original aims with new eyes, developing what I hope is a pragmatic way of thinking about what I used to call 'media literacy education'.

In 2013 when this study began, my daughter was seven and my son was four. I had given up my job as a teacher of Media and Film Studies at a local sixth form college, because I was frustrated by what has been pointed out as the "consistent undermin[ing] [of Media and Film Studies] as academic pursuits by government's refusal to grant them credibility" (McDougall & Livingstone, 2014). In fact this was part of my bigger dissatisfaction with the framing of media education in school practice in general. Having worked previously as a television producer and as an English teacher in a secondary school I had a passionate belief in the importance of scaffolding understanding of how the media 'work' in order to help children become both creative and critical in their engagement. However, I knew from first hand that finding the space to do this in school often relied on the commitment and confidence of individual teachers rather than dedicated space and support in the curriculum. This was in spite of the duty recognised since 2003 in UK policy (via Ofcom) to promote media literacy. Indeed shortly after my study began, a House of Lords report concluded that Government still needed "to accelerate the attainment of digital literacy across the population" (Select Committee on Digital Skills, 2015).

At the same time, I was finding that a lot of the conceptual ideas I was debating with my teenage students were things that in a simpler form could be relevant to younger children. I was as yet oblivious to the proliferating metaphorical "literacies" - digital, web, internet, information as well as media – often used **to** describe models of how to navigate and thrive in the online world and I had

never heard of new literacies or multimodality. However, although I would not have articulated it using the latter terms at the time, I had an instinctive belief that the concept of literacy itself should be widened and that the kind of reflection encouraged by media education could be embedded across the whole curriculum and scaffolded in a more age-appropriate way with much younger children. As an interim measure therefore I was working as a volunteer in a local primary school. My plan was to understand the primary classroom from within, see where and how media education might 'fit in' and ultimately get a job as a teacher again.

Although I had spent some years scaffolding young people to be creative and critical in their consumption and production of media, doing this in family life felt different. My husband had an iPhone, which we used to download "educational" and "creative" apps, and we had recently bought an iPad. However, we constantly felt that we were being caught off guard with questions about things we didn't understand (at this time usually related to *Minecraft*) and incidents for which we were not prepared. I felt conscious of the ephemeral and non-purposeful ways in which my family's digital literacy practices were being lived and frequently compromised by logistics and I wanted to do better. With hindsight, even as a relatively informed parent and teacher, the pace of change was affecting my confidence in what "good use" meant. I could feel the way the Internet was shaping daily life, something I started to read about as 'mediatization' (Livingstone, 2014b), and could sense that reflection about online engagement was increasingly a question of wellbeing, identity and citizenship. But I did not feel in control of it. Although rationally I could see through some of the "myths" or moral panics about technology (Plowman & McPake, 2013) as a mum I still felt the power of popular, sometimes competing, discourses to threaten my sense of being a "good parent". Since I began my study I have become familiar with a wealth of research and commentary on the "fraught spaces" of childhood and increasing pressure on parenting (Sefton-Green, Marsh, Erstad, & Flewitt, 2016, p. 7): for example to understand the detrimental effects of 'screen time' (Kuntsman & Miyake, 2015), to help their children resist commercial pressures (Bragg & Buckingham, 2013), to create 'literacy' opportunities for their children (Bulfin & Koutsogiannis, 2012) and to help children benefit from digital media's potential to open radically-new

pathways to academic achievement or self-expression (Livingstone & Sefton-Green, 2016). Sustained studies exploring parental "imaginaries of unfolding socio-technological changes" have since then revealed interesting insights into "anxieties about parental responsibilities, family relationships, ethical norms and values, and their children's (imagined) life chances" (Livingstone & Blum-Ross, 2017, p. 65). At the time, in common with the parents in these studies, I felt my opinions swayed by "utopian or dystopian hyperbole" (Livingstone & Blum-Ross, 2017, p. 65).

As part of a Masters programme I was supervised by the late Anna Craft and inspired by conversations with her about possibility thinking, creativity, stewardship and education futures (Craft, 2010; Craft, Gardner, & Claxton, 2008) I began to explore wider ideas around the notion of what I called "digital wisdom". In particular I was drawn to thinking about how relationships with devices should be conscious decisions rather than relationships into which we sleepwalk (Selwyn, 2013), how to foster inter-generational dialogue in a world where rapidly evolving technology changes behaviour and thinking (Facer, 2011) and how to understand the "ethical fault lines" raised by online participation and encourage meaningful and responsible "good play" (James, 2009). What I took from this experience was a firmer conviction in the importance of giving children the tools to engage with the ethical, social and emotional implications of Internet interaction and of engaging in reflective, intergenerational discussions with them about our relationships with online devices. Alongside my lived experience as a parent and teacher, my immersion in these broader, more visionary perspectives formed the less tangible foundations of my decision to focus on "reflective engagement'.

At the point my research began in September 2014, "Computing" was introduced as part of a shake up of the Primary National Curriculum. This recognised the need to help children become "responsible, competent, confident and creative users of information and communication technology" (DfE, 2013) from the earliest years, and was seen as equipping them "for the future workplace" and to be "active participants in a digital world" (DfE, 2013). However, the placing of it here in a more technical context (which simultaneously signalled the death knoll of media literacy in the curriculum)

raised concerns for some that sight was being lost of the lived experience of digital culture (Potter, 2011) and that without encouraging the "questioning, challenging and therefore shaping [of the] techno-social system, the scope of digital literacy [would be] limited" (Pangrazio, 2016, p. 171). This was therefore an interesting moment to begin my study.

Bringing together both these lived and academic experiences, my overall aim with this study was to identify ways for parents and teachers to support children's engagement with online devices. However, mindful of the tensions I was experiencing in my own teaching and parenting, I was wary of starting from a normative position. Rather, I was keen to explore what children (and their parents and teachers) were actually doing and develop a genuine understanding of the mutual ways in which their practices and perceptions were shaped. I hoped this would provide a grounded starting point for interrogating existing models of support.

As my research progressed I encountered two main dilemmas. Firstly I had not anticipated the amount of time I would spend simply trying to define what it was I was looking at. The conceptual thinking around what it might mean for children (and adults) to develop criticality in a pervasive and changing online landscape took me in many directions. As I shifted from "media literacy" to "reflective engagement" I detoured at different moments into information literacy, digital literacies, new literacies, wellbeing, e-safety and citizenship trying to find a way to usefully frame my work. Traces of all of these remain, but at times I felt there were too many voices in the conversation. Secondly, I experienced increasing frustration with not having designed a study where it was possible to put more ideas into practice. In the earliest days I had thought about designing a participatory action-research study, but had felt it was important to do the exploratory work first. In this sense, my case study design represented the foundation phase of a larger ambition. In retrospect it was only by about half way through the study, and in particular once I became aware of certain ecological perspectives on literacy practices (Pahl & Allan, 2011) that I began see a way in which the study could have been framed differently to make a more collaborative and emancipatory approach viable. In the end, I focused on finding a way of making my exploratory work as generative as possible, and accepted that reaching a point where it was possible to conceive of grounded,

action-oriented, participatory ways forward was a valuable achievement in its own right.

I researched and wrote this thesis not only as an academic, but also as a parent and former teacher. All these identities shaped and were shaped by the research, making it deeply committed but at times blurring the boundaries between research and life. I believe that the thesis that follows offers not only a contribution to knowledge, but also an honest account of the lessons learnt along the way. Most important to me personally, it offers a window onto the world of some of today's young children whose thoughtful and advantageous (Burnett & Merchant, 2011) relationship with online devices now and in the future is the reason it was worth doing.

Chapter One: Literature Review

Ecology as heuristic device

As an educational researcher and former media educator the motivation for this study was pragmatic: I wanted to explore concrete ways in which schools and parents could be nurturing reflective engagement with online devices from the earliest years. Specific research on this issue with this age group did not really exist therefore in the first instance I felt an exploratory approach was needed that was rooted firmly in the realities of children's lives. My research began from the assumption that in order to understand and ultimately support reflective engagement, it was necessary to see children's practices as socially situated and to understand the contexts (both micro and macro) in which they were shaped. This approach was informed by elements of socio-cultural theory and ecological models of human development . At a micro level this perspective saw value in focusing on the particular cultural practices and circumstances of children's home and school communities. At a macro level, it saw both family and classroom practices as "mesosystems" interdependent with larger social contexts.

In the early stages of my research I felt it was helpful to have a framework to shape my exploration and the metaphor of ecology therefore seemed a useful heuristic. Two particular ecological frameworks developed in research with children and technology informed my thinking. Firstly, in their long-term ethnographic work with younger children Plowman et al. use an eco-cultural perspective based on the theoretical work of Tudge (2008) and Weisner (2002) to explore how engagement with technology is the product of both local and wider circumstances (Plowman, Stevenson, Stephen, & McPake, 2012; Stephen, Stevenson, & Adey, 2013). This approach acknowledges that people, places and things are interwoven with the values and practices that permeate family life and everyday activities and also recognises that children themselves are both shaped by and shaping of socio-cultural practices. Secondly, in her work on the development of technological fluency in children Barron uses the 'learning ecology' framework (Barron, 2006), which situates children within a

"set of contexts found in physical or virtual spaces that provide opportunities for learning" (Barron, 2006, p. 195) and explores the "unique configuration of activities, material resources, relationships, and the interactions that emerge from them" (Barron, 2006, p. 195). What I perceived these approaches to have in common was that they were ways of exploring the particularities of everyday life giving equal analytical attention to the interactions between people and things, the spaces in which the interactions occur and the wider value systems or discourses which shape them.

Informed by these ways of framing research with children and technology I sought to build on existing literature to create an ecological model tailored to my own question that would provide a structured but flexible way of exploring children's practices and perceptions across different life spaces.

In order to do this it was necessary to interrogate firstly, what it might mean to engage reflectively with online devices and secondly, what was already known about the direct and indirect ways in which home and school contexts were shaping children's online engagement. In this literature review I will take each of these questions in turn and then synthesise the findings into the model I used, highlighting the particular gap in the research that the present study seeks to fill and the contribution to knowledge I hope to make.

Children's practices

When this study began, research showed that children were living lives more saturated with media than ever before (Gutnick, Robb, Takeuchi, & Kotler, 2010) and coming into contact with internet-connected devices at increasingly-younger ages (Holloway, Green, & Livingstone, 2013; Kotilainen, 2011; Ofcom, 2013a). A broad picture from Ofcom's annual nationally representative large-scale survey (2013) showed that nearly two thirds of 5-7 year olds were going online (with over a third going online every day). This reflected not only a general improvement in internet access (Ey & Glenn Cupit, 2011; Takeuchi, 2011) but also changing media habits, with mobile devices making a significant impact (Common Sense Media, 2013). This was seen particularly in terms of access to tablets where the figure had risen dramatically over the previous two years (Ofcom, 2013b). When children were using devices they were primarily

playing games, doing schoolwork or playing in virtual worlds, such as *Club Penguin* (Marsh, 2010). One in five children this age were also "look[ing] around online to pass the time or have fun" "watch[ing] 'how to' videos for instructions or reviews" and accessing music or video content through On Demand services and YouTube (Ofcom, 2013). Of note, no questions were asked of under 8s about 'creative, social or civic uses' of the internet such as construction in virtual worlds, uploading photos or making their own games, music and films (Ofcom, 2013) although other studies suggested children engaged in all of these activities (Marsh et al., 2005). Finally Ofcom found only a tiny minority were using online services like Skype and Face Time to communicate. In contrast, another survey of 7 and 8 year olds (Broadbent, Fell, Green, & Gardner, 2013) found a different picture, with at least one in five children using some form of online communication. This is perhaps because their definition of ways in which to connect with others is broader, and includes 'playing games where you can talk to players' which was a common activity with over a third of the children asked.

In terms of the use of online connected devices in school settings, studies suggested that there had been a "rapid uptake of iPads and other 'post-PC' tablet devices in schools" (Clark & Luckin, 2013, p. 2). However, whilst some educators were finding ways of using the internet to enable children to create and interact through online media (Burnett, 2013b), research in early years settings suggested "considerable uncertainty surrounding practitioners' roles with regard to new technologies" (Wolfe & Flewitt, 2010, p. 391) and even amongst teachers keen to embrace working with digital texts, it was acknowledged that there were many challenges (Bailey, Burnett, Griffin, Monkhouse, & Rayner, 2012). Surveys also suggested that in spite of children having access to the internet from a younger age, much e-safety training in schools wasn't starting until later (Passey, 2011). One found that in the UK a quarter of 8 year olds and over a third of 7 year olds had not been taught about staying safe online (Broadbent et al., 2013). Another that 13% of pupils aged 5-7 reported having felt unsafe online - 11% as the result of a particular incident (Passey, 2011). Although there was little research on children's critical awareness around device use, studies in information behaviour had found that children had little ability to identify bias or reference where information was

sourced (Smith & Warner, 2014) and had no recognition of the need for accuracy or truthfulness (Jochmann-Mannak, 2014). In addition it had been argued that uncertainty and "trial and error" are key features of children's practice up to the age of 9 (Foss, Druin, Brewer, Lo, Sanchez, & Golub, 2012). Until then they had a "loopy" or "chaotic" style of navigation often going to particular areas of the screen where they expect to see certain features (Jochmann-Mannak, 2014), clicking "whatever is presented at a prominent position" and aborting clicked pages sooner than adults (Duarte Torres & Weber, 2011). This could be interpreted as children not engaging in reflection. Studies of pre-school children found that children did not often seek help, even though it was, in principle, always available in the playroom (Plowman & Stephen, 2007) and research on 10-11 year olds found that although they could be taught to be aware of the importance of web evaluation skills "they did not use this knowledge when using the Web for their own information need" (Kuiper, 2007, p. 161). Some suggested that as many children were adopting contrasting habits in their home practice to those valued at school, this could lead to a perception that they did not need to be taught (Kuiper, 2007), with one study reporting children's view that 'there [was] nothing to learn' when it comes to the internet (Hasebrink, Livingstone, Haddon, & Olafsson, 2009, p. 37).

The implications of early, common and varied use are wide-ranging. Online connected devices enable "new ways of engaging with others, of representing oneself across multiple communities, of accessing and processing information, and being creative" (Carrington & Marsh, 2008, p. 5) and with them new norms of behaviour and cultural practice are evolving (Weigel, Straughn, Gardner, & James, 2009). In terms of information the online landscape is vast, varied and instantly accessible (Livingstone & Wang, 2013). On the one hand, connectivity is seen by many as offering exciting and empowering ways for children to learn, socialize, create and be civically engaged (Livingstone, 2008); on the other several aspects of it pose challenges to children's wellbeing and learning (Byron, 2008; Nansen, Chakraborty, Gibbs, MacDougall, & Vetere, 2012). In this climate "the demands on parents and teachers to support children and young people's critical literacy are also increased commensurately" (Livingstone, 2009, p. 197). Like researchers across a number of disciplines I was therefore keen to find ways of supporting children to engage healthily,

critically and constructively with online devices

From media literacy to reflective engagement

In order to find ways of supporting children, a crucial starting point was to define what healthy, critical and constructive engagement might look like.

As a media educator, my initial frame of reference was that of media literacy, which seeks "to encourage a systematic understanding of how the media operate, and hence to promote more reflective ways of using them" (Buckingham, 2007, p. 50). However, as I began my research I became aware of a proliferation of 'literacies' through which reflective engagement with devices was being conceptualized. It is beyond the scope of this study to chart the evolution of computer, web, digital and related literacies (for this see Belshaw, 2011). In this section I will describe why I chose to frame my research around 'reflective engagement with online devices' and to deliberately bring a number of these 'literacies' into dialogue with each other rather than adopting any specific model of 'literacy', media or other.

Media education is sometimes presented as having three inter-related dimensions of reflection: creative, cultural and critical (Bazalgette, Parry, & Potter, 2011). At one level it provides children with scaffolding to make conscious choices about how to use different mode and media for specific effect and purpose, taking into consideration the audience for whom in it intended. At another it helps them "explore and reflect upon their cultural responses to [media forms]" (Parry, 2015, p. 3) and at another it provokes critical understanding of how the media 'works' by focusing on the institutions that produce media and the way in which the texts themselves represent the world (Buckingham, 2013). In this respect it aspires "to form part of a strategy to reposition the media user - from passive to active, from recipient to participant, from consumer to citizen" (Livingstone, 2004, p. 20). In school contexts these models have encouraged reflection in relation to four broad conceptual aspects: media language, representation, production and audience.

The new literacies perspective

Although I had been conscious of critiques of certain approaches to media literacy being "overly mechanistic, too teleological and insufficiently social" (Buckingham, 2007) it was only during the course of this study that I became aware that most research similar to my own was actually situated within the fields of new literacies, multiliteracies and multimodality (Sefton-Green et al., 2016). Work in these fields rejects the 'autonomous' view of literacy in favour of a social practice perspective (Street, 1984). The former sees literacy as an unchanging set of conventions and codes, which individuals learn to decode, encode and comprehend. Becoming literate is therefore about acquiring a predetermined set of skills, which, it has been argued, continues to rely on the established canon of the printed word in the middle of the nineteenth century (Potter, 2013a). The latter take a more holistic view that literacy practices involve social and cultural elements as well as more functional reading and writing skills. They see 'literacies' as multiple, dynamic and socially situated; they are 'cultural practices in the making and exchange of meaning' (Potter, 2013a, p. 76) and are constantly evolving in tandem with changes both in technology and in social and cultural contexts (Merchant, 2006). In addition multimodal perspectives argue that 'reading' has changed dramatically (Kress, 2003). We now live and operate in increasingly multi-modal environments, where images, words and layout interact in complex ways and the texts we encounter require more active work to impose order and relevance on what is presented (Yamada-Rice, 2010). As literacy practices are inherently multi-modal and social, much of what was once classified as media literacy, it is argued, should simply now be part of the definition of literacy and there is no need for the 'media' or 'digital' prefix (Belshaw, 2011). In terms of reflective engagement, research from these perspectives sometimes refers to Green's 3D model of literacy as a way of acknowledging a more critical dimension (Sefton-Green et al., 2016). This model suggests that there are three dimensions involved in considering literacy as a social practice – the operational, cultural and critical. These dimensions bear some resemblance to those in the model of media education mentioned earlier (Bazalgette et al., 2011).

The evolution of media literacies

Returning to media literacy, the evolution of the internet has brought about major changes in the production and consumption of media, towards what Jenkins defined as a 'participatory culture' (Jenkins, 2009). In this landscape of "fluid and densely interwoven spaces" (Burnett & Merchant, 2011, p. 41) the need for reflection has changed and questions have been raised around the continued usefulness of existing paradigms like media literacy as critical, awareness-raising tools (Buckingham, 2010), with critics like Gauntlett arguing that the traditional conceptual framework of media literacy is unable to offer sufficient explanatory power to account for shifts in digital media practices (Parry, 2011). In this period, alternatives such as new media literacies, internet safety and social media literacy have emerged, each conceptualizing reflective engagement in different ways.

Jenkins argued that the democratization of resources created the potential for anyone in theory to 'archive, annotate, appropriate, and recirculate media content in powerful new ways' (2009, p. 8). In support of these emergent practices, he and his colleagues defined a set of 'new media literacies' that characterize how people might thrive in the connected landscape. These "cultural competencies and social skills" range broadly from the specific, like 'visualization', to the general, like understanding the affordances of 'collective intelligence' (Jenkins 2009). In this repertoire, 'judgment' is acknowledged as a useful skill, but focuses quite narrowly on establishing the credibility of information. The need for reflection more widely, is acknowledged through identification of the 'ethics challenge', where an important goal of media education is described as being "to encourage young people to become more reflective about the ethical choices they make as participants and communicators and about the impact they have on others" (Jenkins, 2009, p. 26). Some researchers attempting to develop a pedagogy of participatory culture using this model see reflection as developing "critical thinking, problem solving and collective efficacy" through all these skills (Felt, Vartabedian, Literat, & Mehta, 2012, p. 214).

The increasing trend in the online landscape towards social interaction with known and unknown others has also raised issues for reflective engagement in

terms of safety, wellbeing and identity. Media education has long recognised that aspects of media engagement such as advertising and mainstream narratives can impact on self-esteem through things like the reproduction of stereotypes and the representation of body image, but in a culture where young people can now visit places like pro-anorexia forums (Bartlett, 2015), impacts on wellbeing and safety can become more urgent and tangible. Developing reflective engagement becomes increasingly important as children start using connected devices from a very young age. Substantial research on children aged 9+ has resulted in a widely used model for characterising online risks which uses the categories of content, conduct, contact and commercialism (EU Kids Online 2007, Byron 2008). This model frames reflection clearly as a means of defence or resilience building and has become the core of educational guidance for schools and parents available through agencies like UKCCIS, CEOP, SWGfL and Parentzone (Smith & Warner, 2014). These aim to encourage ways of talking to children to help them think more reflectively about their use, but it has been suggested that exploration of the more "media literate" aspects around commercialism, misleading information or advice, bias and persuasion are "more difficult to conceptualise and explore in a primary classroom by non-specialist teachers" (Smith & Warner, 2014, p. 11).

Finally specific models are emerging in response to social media use. One study argues that the way sites like Facebook 'position' young people make it very difficult for them to find the 'space' to critically engage. Here, critical engagement means a range of things, from understanding how sites structure information and interaction in a particular way, to demonstrating appropriate behaviour for the medium and resisting the pressure placed on them in relation to posting photos, posts and having a lot of friends (Pangrazio, 2013). The model that has emerged from this research with teenagers proposes that critical engagement might therefore be developed through a 'meta-discourse' structured around four key concepts: rhetoric, detachment, architecture and reflection (Pangrazio, 2016). Finally an interesting new direction for reflective thinking in the social media context, is through the notion of 'advantageous practice' (Burnett & Merchant, 2011), where the emphasis in scaffolding young people to engage reflectively with social media moves away from "*what are we doing*" to "*what might we be doing*" (italics in original), for example in terms of

civic engagement, empowerment and positive contributions to the community. This work returns to Jenkins, highlighting that more work on ethics, "looking at the world and the part one plays in it", is a needed avenue of further exploration.

Branching out from media literacy therefore I found a number of ways of conceptualising reflective engagement with online devices. However, most of these seemed more pertinent to older children. In fact, when the study began it seemed that in relation to empirical research with younger children there was more research of relevance in the field of information literacy, where the online world is seen as placing an ever increasing burden of responsibility on the user to be reflective and where knowing how to engage with devices effectively and reflectively is recognised as a multi-faceted challenge (Gasser, Cortesi, Malik, & Lee, 2012). Like other researchers I saw the potential to draw on work across these disciplines, for example in the "elision of safety and critical" thinking (Sonck, Livingstone, Kuiper, & de Haan, 2011) or information and media literacies (Bowler & Nesset, 2012) when laying foundations for reflective online engagement from an early age. I took the deliberate decision therefore to look across disciplines to find elements of practice that could be the starting points for supporting reflective engagement in a way that was genuinely responsive to the realities of children's lives.

Elements of reflective engagement

Trustworthiness and appropriateness

As many of the models in the previous section have highlighted, a key element of reflective engagement is trustworthiness and appropriateness. Being reflective might mean thinking about whether and how to trust what you find online, be that in terms of information sources or personal contacts. Adding to the previous section with the perspective from information literacy it is argued this is increasingly important because unlike in the pre-internet era, when higher barriers to the publication and dissemination of information ensured that a restricted group of "gatekeepers" (editors and publishers) were responsible for

guaranteeing authority (Metzger, Flanagin, & Medders, 2010), today user-generated content abounds. In this context, not only is it much easier for young people to access content that may not be appropriate to their age, for example YouTube is significantly used by children across all ages (Smith & Warner, 2014) but the trustworthiness of all content is less clear than ever before (Buckingham & Martínez-Rodríguez, 2013; James, 2009). Scholars have highlighted the way that search engines, and in particular Google, are becoming the online equivalent of traditional gatekeepers influencing what material users deem trustworthy (Hargittai, Fullerton, Menchen-Trevino, & Yates Thomas, 2010).

As with adults, research on children reveals an overwhelming preference for Google (Jochmann-Mannak, 2014). In a nationally representative survey 94% of 7-11 year olds said they had little trouble finding information for schoolwork on the internet, and 10 year olds explained their confidence by saying "I normally just click on the top one" or even "I choose the one where it says 'ads by Google' because it means that Google likes it and Google recommends it" (Broadbent et al., 2013, p. 22). This reliance on Google is a frequent finding: even when interfaces were specifically designed for children based on empirical research into their habits and preferences, children still chose Google as the site they would want to use in future (Jochmann-Mannak, 2014). It has been argued that one reason children do not expend enough effort on reading Google's results critically is not because of a lack of concern for traditional criteria of quality but rather because of their "profound belief in Google's power to find relevant information … expecting some sort of 'intelligence' from Google" (Kuiper, Volman, & Terwel, 2008b, p. 10). From this perspective, faith in Google can be seen not as a lack of reflection but shaped by parents and/or teachers who themselves have adopted certain habits. Interpreting children's use of Google as being based on an understanding of the search engine as a gatekeeper suggests that developing more reflective mental models of how the internet works could be beneficial.

Issues of trustworthiness and sources are also relevant in children's everyday lives, where they need to make judgements about who they are talking to, evaluate sites before entering personal information (Livingstone & Wang, 2013)

and be able to filter genuine content from advertising (Ey & Glenn Cupit, 2011; Nansen et al., 2012). A clear element of reflective engagement in both media and internet safety education relates to commercialism although Livingstone and Helsper (2006) critique narrow views that equate media literacy with the ability to resist the persuasive powers of advertising (Parry, 2015). Trustworthiness is also important in the context of socialising, where in order to make new friends, build relationships and widen their circle of contacts young people need to "learn to manage trust and privacy in online situations that are often unfamiliar, difficult to interpret and liable to change" (Livingstone, 2014a, p. 2) and the potential for connections with both known and unknown others creates the possibility of cyberbullying and grooming. As they get older the challenge becomes primarily social and the concept of what a friend is becomes a more complex issue (Livingstone, 2014a; Pangrazio, 2013). Here questions have been raised over whether young people have effective critical skills to navigate these dangers. Whilst most research focuses on children aged 9 and over, Grimes and Fields caution that these questions should not be ignored in research on younger children (2012). They and others suggest the definition of social networking needs to be broadened beyond Facebook and other adult sites to recognise that a wide range of places frequented by younger children, such as virtual worlds, networked games and content-sharing platforms already construct similar social networking opportunities (Marsh, 2010; Nansen et al., 2012). Some research highlights different problems at different ages, so for example, at age 9-11 children are "preoccupied with the difficulty of distinguishing (online) strangers from (offline) friends in a situation where fakery, forging and false information is rife" (Livingstone, 2014a, p. 7). Finding the level at which reflective engagement around trustworthiness might be appropriate with younger children was therefore one potential starting point for supporting them.

Balance

Another key element of what it might mean to engage reflectively relates to the notion of 'balance'. This is perceived as increasingly important is relation to the "always-on" culture. When this study began debate around "digital disengagement" was becoming more prevalent (Kuntsman & Miyake, 2015)as a response to anxieties over "screen time" and addiction common in popular

discourse. Adding to this from an information perspective, it is also argued that the internet's abundance and ease of accessibility threatens to overwhelm users with "information overload" leading to difficulty in sustaining attention, engaging in reflection and converting knowledge into deeper understanding (Carr, 2010). Research shows that although many people are able to talk about the analytical strategies they should be using when engaging with online content, very few of them actually *do* them (Hargittai et al., 2010). Researchers refer to this as "satisficing" or coping with information overload by "seeking strategies that minimize their cognitive effort and time" by exerting just enough effort "to provide a sufficiently optimal outcome for the context" (Metzger et al., 2010, p. 417). Two prevalent strategies observed by researchers are the use of "shortcuts" or heuristics, like relying on familiar or branded sites or choosing sites that look professional to make decisions, and getting advice from others in one's social circle, or asking for others' help (known as "social search"). Through blogs, wikis, social bookmarking, social networking sites, and ratings, recommendation, reputation, and credentialing systems people are sharing and contextualizing information in new ways that enable them to learn from each other. Of interest here is the mounting evidence to suggest that these practices are not necessarily ineffective ways of making judgments (Gasser et al., 2012). This has sparked some in the field of credibility research to wonder whether more attention needs to be paid to understanding what makes certain strategies "good enough" (Metzger & Flanagin, 2013) and to suggest that being reflective might actually mean nurturing the awareness and flexibility to balance effort and result.

Many researchers therefore are arguing that if we want to support children we need to pay more attention to their alternative ways of doing things (Foss, Druin, Brewer, Lo, Sanchez, & Golub, 2012). Through this lens strategies that appear at first glance to be lazy or lacking in reflection can be interpreted slightly differently. One study explored the extensive use of "copying and pasting" among 11 and 12 year olds over the course of a five-week school research project, analysing peer-group interaction over time children to see how children talked about the things they had copied and what they did with them as a result (Rasmussen, 2009). Using this approach, new aspects of the activities emerged and it was found that "what first appeared to be only a technique that

the pupils used for rapid task completion seemed to contain aspects of engagement and effort" (Rasmussen, 2009, p. 189) . Some people argue that the ease with which it is possible to copy and paste from the internet is making children grow up uncritical. Rasmussen argues that whilst this is possible it is not inevitable. Within the children's own practices things emerge which we must be careful not to overlook in a blanket of disapproval of adult norms. To say pupils copy because they are lazy appears to be a somewhat superficial and hasty conclusion and she concludes: "copying … appears to be a worthwhile information management strategy in an environment that contains a massive amount of information" (Rasmussen, 2009, p. 191). Researchers often conclude that efficiency is the driving criteria influencing children's evaluation practices; they want to get it done quickly and exhibit little patience (Jochmann-Mannak, 2014). However, for some children (or perhaps in some contexts) what is important is that information has the "quality of convenience" (Gasser et al., 2012, p. 32). Reflective engagement could mean deciding when and why more effort is worth spending.

In broader terms then, a focus on balance is a starting point for reflective engagement both in terms of quantity and quality (of time and information), and in terms of learning and wellbeing.

Visual criticality

Another element of children's practice around which reflective engagement could be happening is in the creation, reading and evaluation of images, which are increasingly used as sources of information and in communication. One study of 4 year olds in their home settings found that even at this age children were using visual attachments in emails, taking photos on mobile devices and using webcams (Yamada-Rice, 2010). Where they were not doing this independently they were participating in their parents' visual communications. The importance of the visual as part of wider multimodal literacy practices has long been recognised Flewitt, 2010). However it has been argued that there is a lack of frameworks for evaluating and critiquing images and that "learning to 'read' images by osmosis … is [not] the same as having been taught skills to produce, criticise and evaluate visual meaning-making" (Yamada-Rice, 2010, p. 344). In terms of the present study, what was interesting was research that

looked at how children used images and what kind of reflection they engaged in around them. Research in information literacies has found that children often gravitate towards visual rather than text based information. When 8-10 year olds were asked to characterize "good" information they reported that large amounts of text could be a frustration, especially when no results were found (Shenton, Nesset, & Hayter, 2008) and another study found it was common practice for children to make decisions based on the visual (and interactive) elements of the page (Jochmann-Mannak, 2014). Children appear to have much more patience for visual material than written, "wait[ing] for graphics to load before moving on to another site, even when the pictures had nothing to do with what they were seeking initially" (Slone, 2003, p. 411). Visual material is increasingly seen as a valuable way of both finding out information and presenting it. One study found that 6-10 year olds invested more time and enthusiasm on visual and design aspects, copying and pasting images and experimenting with layout, even though not asked to do so by the teacher, and taking ownership of their use of visual features (Burnett, 2013a). In another study it was also found that the seeking of pictures was the activity that led to more interaction and cooperation between the children; pictures were artefacts to gather, show and exchange (Lundh, 2011). However, classroom expectations of finding relevant information are often in tension with children's intuitive practices. One in depth study of 9 and 10 year olds argued that the framing offered by teachers was one where information meant text and visual material was purely decoration and there were rarely any in-depth discussions of how pictures could be interpreted or used as semiotic tools (Lundh, 2011).. Helping children learn how to evaluate, interpret and create visual information is therefore one way in which reflection could build on actual practice (Burnett, 2013a; Lundh, 2011; Yamada-Rice, 2010)

Affective experience

When thinking about reflective engagement, a final element of practice that can challenge attempts to encourage and scaffold is the affective and non-rational nature of experience. Key advocates of media education have long pointed out the dangers of adopting an "unduly rationalistic, 'counter-propagandist' approach" which leaves little place for "aspects of pleasure, sensuality or

irrationality, which are arguably central to most people's experience of media and culture" (Buckingham et al., 2005, p. 23). It has been suggested that media literacy could be criticised for "representing a narrow, rationalistic view of how a well-regulated individual should behave in relation to the media – and one might well argue that it … could hardly be applied to the majority of adults" (Buckingham et al., 2005, p.23). One of the consistent difficulties that has been found when trying to encourage criticality in relation to media engagement is that in order to be critical you need to detach yourself: "to critique the site is to stand 'outside' the discourse, which essentially counters the very purpose of being on there in the first place" (Pangrazio, 2013, p. 45). In younger children the "natural disposition to trust and the ease with which their focus can be diverted from safety to fun", for example by attractive invitations and the appeal of winning, has been highlighted (Ey & Glenn Cupit, 2011, p. 69). These studies suggest that children's responses to media are tied up in identity and emotion and any scaffolding of reflective practice needs to balance more serious pedagogical aims with learner interest (Burnett & Merchant, 2011).

Understanding what motivates children is therefore a key factor in their reflective engagement. In information literacy this recognition that emotional as well as cognitive factors are crucial in understanding how children behave with online information is referred to as the "affective paradigm" (Bilal, 2005). At a micro level, research from this perspective draws attention to the trajectories of emotion that children go through as part of a search activity as these are seen as having an impact on the reflective strategies they use (Kulthau, 1991). Studies have found that children are more likely to engage reflectively if they experience positive emotions – if they get frustrated or bored they are more likely to give up or choose something for expediency reasons (Foss, Druin, Brewer, Lo, Sanchez, Golub, et al., 2012). Other research has looked more broadly at what motivates children to engage with online information. One study of 7 and 9 year olds in the home found this was most often entertainment and "personal interest". Many boys in particular reported games as a trigger, but children also mentioned being referred by a friend, a daily activity or event in their lives (e.g. Halloween) or a desire for social interaction. This study acknowledges that children have different preferences and motivations for engaging with online information by identifying seven distinct "search roles":

Developing, Domain, Power, Visual, Distracted, Rule-Bound and Non-Motivated (Foss, Druin, Brewer, Lo, Sanchez, & Golub, 2012). Of these, the only ones who exhibited typically recognised powers of judgment were "power searchers": confident (one might say "ideal") users who are reflective, aware of sources and fact checking. These children had an understanding of how search engines work and appeared to have internalised certain "rules" of good use for example relating to useful URLs (Foss, Druin, Brewer, Lo, Sanchez, Golub, et al., 2012). They were usually "knowledge seeking" for school or personal reasons, rather than using online information for entertainment. "Rule bound" were also more likely to be driven by school assignments but sought information online according to an inflexible, limiting set of rules that they struggled to adapt to different types of searches. These searchers were the most likely to stop searching because of boredom (Foss, Druin, Brewer, Lo, Sanchez, & Golub, 2012). The authors suggest this is perhaps a predictable outcome given that these children are usually motivated to search by a school assignment in which they may have no personal interest.

When thinking about reflective engagement therefore, it needs to be acknowledged that children's routes through online behaviour are not necessarily rational. Nonetheless, some studies argue that distraction sometimes leads to "serendipitous interesting information" (Nesset, 2009). For example, an early study of public library users, found that children aged 7-12 were more likely to use computers "recreationally"/to entertain themselves, and were less goal- or topic-motivated when searching than older age group (Slone, 2003). This study found that children were quite flexible in their expectations: When they could not find what they originally sought, they settled for something that was just as ''interesting'' to them. One of the most wide-ranging and influential ethnographic studies of youth online practices identify this practice as "fortuitous searching" where rather than finding discrete forms of information, teenagers move from link to link, looking around for what they describe as "random" information (Ito et al., 2008). This might be to find material for creative production, to find out more about a particular band or to get help with a game. The authors argue that this practice is one of the first points of entry for "messing around" with new media, a "genre of participation" they suggest is a crucial way of learning how the web works. They suggest that young people's

online engagement is better characterized in terms of how it is motivated – friendship or interest driven – and how it is experienced. In addition to "messing around" it is also observed that young people participate by "hanging out", engaging in activity primarily as a social experience, or "geeking out", engaging in it to pursue a specific learning objective. Failing to take into account the emotional and social aspects of online engagement can lead to children seeing critical initiatives as 'dampeners' on their enthusiasm for digital technologies (Cranmer, Selwyn, & Potter, 2009). Some studies therefore urge a shift in emphasis: "the task for education may not lie primarily in teaching students Web searching skills, but in showing students <u>the need for</u> … reflective use of these skills" (Kuiper, 2007, p. 164).

In this section I have attempted to justify the use of 'reflective engagement' as a guiding concept for this study. I have then identified some potential elements of reflective engagement in the lives of young children by tracing common ground across media, information and new literacies. I have represented these in the diagram below:
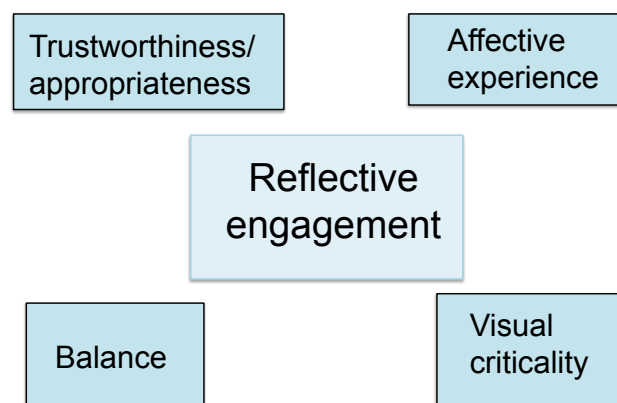
Figure 1: Model of reflective engagement based on literature

In the next section I will look at the research on the 'ecologies' of children's online practices that existed when my study began. First I will look at research in the home context and then in the school context. In each I will interrogate how both direct and indirect aspects of context can shape children's perceptions and practices.

How engagement with online devices is shaped in the home

The shaping of perceptions and practices of online use begins for a majority of children at birth (Livingstone, Mascheroni, Dreier, Chaudron, & Lagae, 2015) with most research agreeing that family practice is a key factor in shaping how young children perceive and use the internet (Barron, Martin, Takeuchi, & Fithian, 2009; Eynon & Malmberg, 2012; McPake, Plowman, & Stephen, 2013; Stephen et al., 2013; Takeuchi, 2011). Children do not surround themselves with devices. Parents and other families model their role in family life through "both intentional and incidental acts of childrearing: purchases, scheduling, household-space arrangements, supervision, rule setting, and so on" (Gutnick et al., 2010, p. 38). However, there can be huge variation in the ways parents model and mediate online use for children (McPake, Stephen, & Plowman, 2007). Researchers have explored technology use in the home from a number of perspectives seeking to understand how contexts create 'safe' or age appropriate spaces for children (Nansen et al., 2012), enable learning to take place (Davies, Good, & Cranmer, 2009), encourage technological opportunities for children (Barron et al., 2009), integrate devices into daily life (Takeuchi, 2011), support emergent literacy practices (Marsh, 2001) and make a difference to playing and learning with technological resources (Stephen et al., 2013). These studies offer a range of ways into thinking about how both conscious and inadvertent behaviour and decisions can shape engagement. As a starting point, I will highlight two complementary ways of looking at how home contexts shape use. On the one hand, the more direct means described in parental mediation literature, on the other, more indirect means observed by looking through the lens of domestication and modelling

Mediation

One of the most direct ways researchers have sought to explain how parents shape their children's engagement with online devices is to characterise the range of parenting strategies they use to 'mediate' their use. These studies seek to evaluate the effectiveness of such strategies at preventing risk and providing opportunity (Duerager & Livingstone, 2012; Haddon & Vincent, 2014; Hasebrink, Gorzig, Haddon, Kalmus, & Livingstone, 2011; Livingstone, Davidson, Bryce, Millwod Hargrave, & Grove-Hills, 2012). Early studies in parental mediation proposed that parents tended to employ combinations of three possible strategies of media regulation: restrictive mediation, co-viewing and active mediation (Clark, 2011b; Nathanson, 1999; Valkenburg, Krcmar, Peeters, & Marseille, 1999). Restrictive mediation referred to rule-making about the content and frequency of children's media use; co-viewing referred to parents simply being present while their child engaged in media use and involved primarily nonverbal communication; and active mediation assigned importance to the dialogue between parents and children, and focused on "the pedagogical efforts of parents to ask the child questions about what he/she is viewing, to solicit the child's reactions to the content, or to model media literacy skills" (Takeuchi & Stevens, 2011, p. 11). As the media landscape has become progressively more complex and the devices used to access media more varied, other ways of describing the mediation of use have emerged, for example "supervision", a non-verbal parental presence "keeping an eye on the child from a distance" (Nikken & Jansz, 2011, p. 1). Some argue that the personalised and portable nature of devices has rendered traditional strategies of media co-use or supervision less available or effective and that the growing complexity of the media landscape leads to a power imbalance where parents lack the technical expertise to understand how to help (Haddon & Vincent, 2014; Mascheroni & Olafsson, 2013). In response to this the media industry increasingly provides technical ways of restricting and monitoring children's use and there is evidence of growing awareness of these by parents (Ofcom, 2013). Researchers continue to refine these categories as the online landscape and associated strategies evolve.

A number of quantitative studies have tried to link strategies to outcomes and these are usually driven by questions around risk and safety. They tend to have been conducted with parents of older children, but nonetheless they offer a starting point for exploring the 'effectiveness' of different styles of mediation. They show that most parents use a combination of strategies and that these differ with the age of the child. There is a suggestion that in the early years these are primarily apply supervision and co-use, whereas when children reach 7 or 8 parents increasingly use restrictive mediation or monitoring (Nikken & Jansz, 2011). Furthermore, most parents with children ages 6 and under do not set parental controls on their computers, while most parents with children ages 7 and older do (Takeuchi, 2011). During the course of my study more research emerged that corroborated this (Chaudron, 2015; Livingstone et al., 2015). Unsurprisingly, a consistent finding across this literature is that the surest way of limiting children's exposure to online risks is to use restrictive mediation, although interestingly research shows no association between the use of technical tools and a reduction in risk (Duerager & Livingstone, 2012). However, restrictive mediation also appears "to limit children's online opportunities to learn and explore, develop digital skills or gain resilience to risk" (Livingstone et al., 2015, p. 9). In addition, the argument is made that restrictive mediation might be less effective and even cause hostilities with older children who tend to resist overly strict parental rules (Clark, 2011a). Retrospective monitoring and active mediation of safety shows no clear benefits, with researchers suggesting this is probably because they are used in reaction to things that have happened rather than proactively as preventative measures. Overall active mediation of use is recognised as the strategy most likely to provide opportunity, whilst also reducing the likelihood of encountering online risk (Duerager & Livingstone, 2012). More importantly perhaps, children of parents who used active mediation are likely to be more resilient to being upset if they did encounter something inappropriate and in teenagers active mediation is shown to influence self-efficacy and expertise (Barron, Martin, Takeuchi, & Fithian, 2009; Eynon & Malmberg, 2012; Livingstone et al., 2011). Looking at it from the perspective of encouraging autonomous reflective online practice this would suggest that active mediation is the most effective strategy.

However, the definition of what active mediation actually involves and the extent to which this is different from co-use was not always clear. Since the study began these concepts have continued to be refined with a more recent categorization distinguishing between "active mediation of safety" and "active mediation of use". The latter incorporates some of the previous strategies, with both supervision and co-use becoming part of a spectrum that covers parents talking to their child about the internet, staying nearby or sitting with them while they go online, encouraging them to explore the internet, and sharing online activities with them (Livingstone et al., 2015, p. 8). However, I felt that more nuanced characterisations of active mediation and co-use were needed that acknowledged more holistic contextual factors. I particularly thought this was important because 7 seemed to be an age where co-use was declining, but parents still thought their children were too young for being talked to about online risks (Ofcom, 2013). They were potentially therefore in a kind of vacuum of active support.

Modelling

As well as some of the more direct mediation strategies used by parents in order to control or guide children's use of devices, there are also indirect ways in which parents model use and these too play a part in how reflection about online devices is encouraged. Modelling can happen both at the level of the environments families create around device use or at the level of their own visible behaviour with devices. Plowman and Stephen suggest that parental support for young children's learning with technology can be conceptualized in terms of "distal and proximal interactions" (2007). Proximal interactions are direct exchanges that occur when adults observe and engage with children as they engage with technological or any other resources in the playroom or at home. Distal actions are indirect activities, plans and decisions that support and influence children's actions and learning opportunities (Stephen et al., 2013). These environmental factors are one example of distal influences.

In terms of the material environment, early ethnographic study of home computer use argued that "the decision of where to locate devices in the house reflected and reinforced different family views about how time should be spent

within the home" (Facer, Furlong, Furlong, & Sutherland, 2003, p.49). Researchers used metaphors to describe the ways in which the computer was embedded into family value systems: in different homes it was "the children's machine", an "interloper" and "the heart of the home" (Facer et al., 2003). Much has changed since the days when the single desktop computer was a shared family resource, but the different ways devices are "physically (and symbolically) located within the home, how they are fitted into our routines and hence time structures" (Haddon, 2007, p. 2) still give messages about their role in family life and indeed life more generally. Increasingly the ways in which children access the online landscape are mobile (Mascheroni & Olafsson, 2013), changing the geographies of where they live both virtually and physically (Facer et al., 2003) and making the relationship between online and offline domains more complex by embedding the household in local and global networks or mediascapes (Appadurai, 1996 as cited in Marsh, 2010). The accessibility of internet-connected devices therefore presents a challenge to parents in terms of their control of children's movement in the 'outside world' (Valentine & Holloway, 2001) and part of the way they model expectations for children is through the process of defining certain 'spaces' as suitable or unsuitable for them. Some research therefore urges attention to material environments and facilitation of device use and the value systems these reflect or create. Studies note on the one hand how some parents deliberately craft a specific media space at home, for example by limiting the amount of electronic screens in the house in favor of free play and creative activities (Ito et al., 2010) or create 'educational' environments through "behind the scenes work including provision of materials, arrangement of space and the establishment of daily routines" (Plowman & Stephen, 2007), whilst others shape the environment around the use of media devices for relaxation and entertainment (Nikken & Jansz, 2011). Another way of looking at how parents can act as material facilitators can be found in a study of the development of technological fluency in middle school students, where Barron et al. identified seven distinct roles: teacher, collaborator, learning broker, resource provider, nontechnical consultant, employer, and learner (2009). Of these, several involve material provision, for example purchasing of devices, driving to specific events and paying for tuition.

In terms of parental behaviours, research has also noted that the way parents use devices in the home environment is a key factor in shaping how young children perceive and use the internet. Through their own interactions with technology family members act as role models for children, who copy their behavior (Nikken & Jansz, 2011; Takeuchi, 2011). It is argued that by having phones constantly visible or audible, this gives a message about the need to be constantly available (Bedell, 2015), with some research noting that parental use of phones at the dinner table or whilst pushing children on swings gives strong negative messages about the value of conversation (Turkle, 2011). However, inadvertent modeling is not always seen as negative. One study of 7 year-old children using the internet for searching in the home, found that children frequently said that they learnt how to do things through watching their parents looking for information online (Druin, Foss, Hutchinson, Golub, & Hatley, 2010a) and another study of everyday routines and practices in the home found that although the adults often believed their children were "just picking it up" when it came to demonstrating new technical skills (Stephen, McPake, Plowman, & Berch-Heyman, 2008) what they had not realized was that they were unwittingly modeling technical practices in front of their preschoolers (e.g., logging on to the computer, using the remote control). This study also notes that 'sharing enjoyment or fun' played an important role in encouraging learning around devices, suggesting that in addition to operational skills that parents might model for children, it is the way they 'frame' the internet as having positive affordances that is important. In terms of how modeling shapes beliefs or perceptions, some studies also look at the impact that parental confidence with technology and general views about the educational value of the internet are transmitted to their children. One study demonstrated a link between young people's perceptions of their parents' success in online information seeking and their own self-efficacy beliefs about online information seeking (Eastin, 2005). The more positive the experiences of these networks of support in online information seeking, the more likely the individual is to believe in their own abilities to engage (Eynon & Malmberg, 2012). Hollingworth et al. observe similar findings – the more confident the parents (which often arises through gaining mastery of technology in their professional lives) and the more positive their relationship with formal education, the more likely their children were to see internet use as a learning experience (2011).

What some of the ideas around modelling suggest is that the environment itself, along with material decisions about purchasing and providing access need to be taken in to account when thinking about the ways that children's use is shaped and reflective engagement either encouraged and supported or not. However, it also needs to be acknowledged that sometimes material or logistical factors compromise family efforts to shape device use in a particular way. Although most parents have the intention of investing effort in their children's media use, they sometimes find it difficult to do so (Nikken & de Haan, 2015). Their value driven decisions are often compromised by a host of everyday practicalities including limitations of time, space, energy, family make-up and finance (Stephen et al., 2013). It is clear therefore that parents also take the practical value of the media for structuring their family life into consideration when balancing their young children's media use (Nikken & de Haan, 2015).

Parental values

Mediation and modelling are two ways in which parents can directly and indirectly shape children's practices with and perceptions of online devices. They can be enacted materially and socially and are sometimes conscious, sometimes more inadvertent.   On top of logistical factors such as time commitments and family make-up, other aspects of parents' lives influence how they perceive and embed devices in home, such as their own experiences of education, their access to material resources and the ways they engage with technology in their daily lives (Hollingworth et al., 2011). In addition parental attitudes towards media, their perspectives on the value of technology for education and their views on how to support their children's learning in general (McPake et al., 2007) mean that the same range of strategies can be experienced differently in different families. Some studies describe these parental values as "ethnotheories", culturally-shaped systems of beliefs within families (Kenner, Ruby, Jessel, Gregory, & Arju, 2008; Marsh, Hannon, Lewis, & Ritchie, 2015; Marsh, 2014; Stephen et al., 2008) which inform their patterns of behaviour and the nature of the scaffolding and 'curriculum' offered to different children (Kenner et al., 2008). These beliefs are informed or sometimes confused by wider, often competing, discourses in relation to the

role of technology in society and in particular how the idea of the "good parent" is constructed in this context (Clark, 2011b). One study focuses on the way class differences affect the way parents 'frame' use of devices, arguing that middle-class parents are more likely to capitalize on them for their children and "use [them] as a resource, as a part of wider strategies of 'cultivated enrichment', expressive of middle-class modalities of parenting" (Hollingworth et al., 2011, p. 357). This is echoed in ethnographic work (in the US), which also found that family attitudes towards the role of device could be roughly divided along class lines (Clark, 2013). This study offers two characterisations of family values: expressive empowerment and respectful connectedness. The former, most common amongst the middle class, encourages media use for learning, expression and personal development, and discourages media use that seems to promote distraction or time-wasting (as they perceive it); the latter, more common in less advantaged families, emphasises media use that is respectful, compliant and family-focused (Clark, 2013).

In terms of learning, parents range from those who believe technology offers opportunities to those who see technology as a threat to or a distraction (Plowman, McPake, & Stephen, 2010; Takeuchi, 2011). There is some evidence that parents more often co-use the media with their child or actively discuss the content if they feel that the media offer educational or entertainment opportunities (Sonck, Nikken, & de Haan, 2013). This might suggest that children of parents with negative views of technology are less likely to be given opportunities to be reflective themselves about it. One in-depth case study of 9 year olds' use of online devices for learning in the home illustrates this (Davies et al., 2009). One pro-technology father helped his son to critically evaluate the information he found on websites, whilst another allowed his son to use Google when he was watching but offered no guidance on the relative values of websites. A mother on the other hand, limited use of the internet for learning because of her suspicious of the worth of the Internet as a source of knowledge. She preferred to give her children experiences which will 'encourage them to think for themselves, be creative in their thinking', something she did not associate with using technology. The way in which each of these children was supported to be reflective therefore was a result of their parent's views about the value of technology for learning.

In contrast, the framing of device use sometimes centres more on family values of wellbeing. Here parents range from on the one hand seeing online devices as offering an opportunity for enhancing family life, relaxation and enjoyment (Padilla-Walker, Coyne, & Fraser, 2012) and on the other hand expressing concerns that devices create a barrier to shared family time and a threat to children's health and development (Nikken & de Haan, 2015). In terms of the former, some parents associate co-viewing with more time spent watching television and exposure to adult content, whereas others highlight a range of positive outcomes, from gains in comprehension and increased responsiveness to family closeness and better understanding of human relationships (Connell, Lauricella, & Wartella, 2015) . Many parents feel that through media use their young children develop "knowledge and understanding of the role of media and technology in society" (Marsh et al., 2005). But this can vary greatly depending on whether parents are more concerned about negative effects of media use or their positive educational and wellbeing effects (Nikken & Jansz, 2011). Active mediation might equally involve parents attempting to "mitigate negative effects of the media such as aggressive behaviour or the cultivation of a skewed worldview" (Clark, 2011a, p. 11). Here not all parental efforts at talking about their children's media choices are well received, nor are they necessarily effective in achieving parental intentions regarding media use. One ethnographic study of teenage family life captured conversations that highlight how 'active mediation', when justified using different rationales, can manifest in different ways with different outcomes (Clark, 2011a). In this study, one mother viewed the media as a problem that she as a parent needed to counteract. She thought she was helping her daughter to attain a more realistic sense of what to expect from life by mediating through argumentation, however by not listening to her daughter's own perspective this strategy became ineffective. In contrast another mother engaged in active mediation, not only to express her own views, but also to hear her daughter's responses to the media and to her own views. The most effective part of this strategy, as reported by the teenager, was her parents "giving things a chance before passing judgment" (Clark, 2011a, p. 25). In terms of the present study, what these studies suggest is that active mediation is not in itself likely to encourage reflective engagement; it needs to be coupled with an open-ness to listening and being responsive. Although this

research was based on observation of older children, it is interesting to ask whether similar approaches are beneficial with young children.

Pedagogical, social and emotional interactions

Following on from this it is interesting to turn to research which has sought to characterise in more detail the minutiae of pedagogical strategies involved in guiding children's device use in the home. Here, extensive research by Plowman et al. suggests that as well as acquiring operational skills and extending traditional learning in maths, language and general knowledge of the world, interactions between children and parents around technology can also scaffold other types of learning more akin to reflective engagement (2012). For example, "develop[ing] children's concepts of technological interactivity and mak[ing] visible their understanding that taking an action can produce a response" (Plowman et al., 2012, p. 36) and developing understanding of "the role of technology for a range of social and cultural purposes" (Plowman et al., 2012, p. 37). In their observations of parent-child interactions in the home around online devices they identify a rich range of ways in which family members are involved in "teaching" as part of everyday routines and practices. These include demonstrating, explaining, instructing, managing, supporting, prompting, extending questions and providing feedback. These are all strategies the researchers also find occurring in pre-school. However, where there is a difference is in the additional emotional support offered by parents. A large part of the way parents help scaffold children's engagement with devices is in helping them overcome their frustration at lack of success or mastery of the functions or competitive elements of the technologies (Stephen et al., 2013). Parents are also seen praising, monitoring scores and sharing enjoyment. They are therefore supporting "independence, persistence and patience in the face of initial difficulties and developing self-knowledge about how they learn" (Plowman et al., 2012, p. 36). In so doing they are scaffolding children's capacity for critical self-reflection. Bringing this repertoire together with their observations (mentioned previously) of the more indirect ways in which parents shape perceptions and practices in the home, Plowman et al. develop the concept of "guided interaction" as a useful strategy for both parents and teachers (2012). This strategy acknowledges the benefits of both proximal and

distal support and encourages adults to look reflexively at the whole spectrum of their interactions when thinking about how best to help children.

The need to support the complexities of a child's whole self, this time in searching for information, is similarly argued for in a qualitative study of 7 year children at home. As well as identifiying a number of direct ways in which parents intervene to support their children's online information practice, ranging from helping their with spelling and suggesting keywords to offering guidance on which links to follow from the results page or which websites to visit, this study also highlights the role parents can play by being attuned to their children' frustrations, a key but sometimes overlooked barrier to successful information behaviour (Foss, Druin, Brewer, Lo, Sanchez, & Golub, 2012). This study also highlights that although all parents employ similar strategies, there are three distinct levels of control used: fixing, demonstrating and mentoring. Fixers take over searching tasks for the child. Demonstrators sit with the child at the computer and show them how to do a task, yet still let the child search independently. Mentors support their children with advice/guidance but do not sit at the computer with them (Druin et al., 2010a). A number of the parents suggested that their children didn't need any assistance because they felt that the child was more fluent than they were, whilst others clearly saw benefit in giving their children more autonomy. Some parents think standing back can also be a way of supporting children. In another study, Eynon and Malmberg found that the most important contribution made by parents to children's effective information seeking was the extent to which they had helped them develop a strong "self-concept" for learning (2012). That is to say, if they believe they are good at learning they are more likely to use the internet for learning. A slightly different perspective can be found in studies of family literacy practices. One case study of an eight-year old child's out-of-school information literacy practices for example, illustrates in great detail how these are shared social practices with family and friends, for example, researching religious gurus important to family life or compiling elaborate information charts of sporting teams and their progress (McTavish, 2009). These literacy practices are part of a reflexive relationship with their context and identities (Barton & Hamilton, 1998) and parental engagement and the domestic environment are powerful factors in how they develop (Livingstone, 2015).

However, even with very young children some research has shown that it can be the case that parents' assumptions about how something is supposed to work can prevent them engaging in constructive co-learning and be a stumbling block to more reflective engagement. One study of parents and children using Leapfrog tablets in the home highlights how interactions were shaped by "the adult's conception of appropriate use", which related to traditions or practices with which the adult is familiar (Eagle, 2012). In observations parents saw it as appropriate to show the child the 'correct way' to do things and consequently during shared use children made contributions that they ignored. The implicit assumption was that the point for the child was to achieve a goal set by someone else. The study concludes that an instructional way of interacting with the devices did not lead to the best learning (Eagle, 2012). Instead, child-directed, child-sustained, exploratory modes of interaction are a more fruitful way of supporting children's learning at home. This complements further findings by Druin et al. who identify that the reason for doing something, level of purpose and level of external control all play a part in defining how use is experienced and conclude that "motivation deficits, on-going distraction, and limiting rules can all lead to search breakdowns" (Druin, Foss, Hutchinson, Golub, & Hatley, 2010b, p. 9). The extent to which rule-making in particular actually helps children is questioned in this study, as the findings suggest they constrain children, leaving them unwilling to deviate from their search pattern or worse, missing an answer due to their refusal to consider breaking the rule. The study concludes with the need to "more fully consider the triggers that excite children" and create a culture "where children are given tools and inspiration, rather than rules" (Druin et al., 2010b, p. 9).

Earlier in this section it was highlighted that 'sharing enjoyment or fun' might indirectly be a stepping-stone to reflective engagement (Stephen et al., 2008). In this light it is interesting to revisit the research around co-use or co-viewing. On the one hand, some researchers argue that although it can be seen as a "passive parental activity" co-viewing can actually provide an avenue for family connection and common experience (Connell et al., 2015). This could complement studies that suggest "parental warmth" is a factor that can be directly linked to better internet use (Valcke, Bonte, De Wever, & Rots, 2010). On the other hand, researchers argue that parental presence, even with no

scaffolding, can lead to "just in time" learning. When parents are present and available, "conversation about the online activity, including interpretive or evaluative comments or guidance, is more likely" (Livingstone & Helsper, 2008, p. 589). This is something that has been observed by the Sesame Workshop for over forty years, namely that "actively engaging with an adult, who comments on and questions the content, increases a children's learning from a show" (Gutnick et al., 2010, p. 37).

This belief in the power of co-use is focusing increasing research attention on "joint media engagement" (or 'participatory learning') - the process of parents and young people striving to learn together through joint interactions with media (Clark, 2011a; Gutnick et al., 2010; Takeuchi & Stevens, 2011). Children have always influenced the literacy behaviour of other family members and practices are co-constructed across generations (Marsh, 2014). With the introduction of new technologies and the rapid evolution of the online landscape, studies suggest that amongst parents of slightly older children many report learning from, as well as teaching, their child (Barron et al., 2009; Phippen, 2013a). This more fluid dynamic recognises that for a family to be engaged in active mediation, there needs to be space not only to give voice to the parents' views, but also to hear the young person's responses to the media, and thus conceptualises the parent-child-device interaction as a three-way, rather than a one-way process. When this study began research was suggesting that although many parents enjoy reading and watching with their children, game play or using the internet "garner meager enthusiasm" (Gutnick et al., 2010) and that parents find it harder to share media experiences with children in new media than via television or books and films (Takeuchi & Stevens, 2011). This tension was leading some to explore the intergenerational potential of newer technologies and advocate designing for multiple generations, actively involving not only children but parents and grandparents (Takeuchi & Stevens, 2011).

Bringing these ideas together helped me to think about the ways reflective engagement with devices in home contexts is shaped in ways that are direct and indirect, conscious or not and multi-directional. Emerging from across these fields I identified four potential 'aspects of context' as areas for exploration: material, cultural, pedagogical and socio-emotional. I felt these ways of framing

home practices could lead to insights about how reflective engagement is encouraged. As I was keen to find a framework that could be applied equally to home and school in the next section therefore I will look at school-based research using similar headings.

How engagement with online devices is shaped in primary schools

Just as in the home, there are different aspects of school contexts that directly and indirectly shape children's engagement with new technologies.

Cultural values and discourses

Discourses and policies shape in part the way schools incorporate new technologies into the classroom and embed and discuss practices around them. They have the potential to influence how reflective children (and adults) are encouraged to be. At the time the present study began, much public discourse celebrated the positive role for technology in school. Michael Gove, then Education Secretary, described in his speech at the 2012 BETT conference how "new technology is a disruptive force. It innovates, and invents; it flattens hierarchies, and encourages creativity and fresh thinking" (Gove, 2012). However, as Livingstone notes: "familiar social practices are conservatively reproduced in relation to the internet much more readily than is the internet used to challenge or reconfigure offline practices" (2009, p.88). There were therefore those who urged caution against determinism and the belief that through sheer virtue of using technology, education would be improved. Indeed, it was argued that the uncritical introduction of technology into schools risked perpetuating a lack of reflection about the impact of technology in society more generally (Selwyn, 2013), and it was urged that children's online information activities be embedded in wider discussions of technology use (Facer, 2011). These debates were interesting because, just as with parental decision-making, they highlighted that there was much variation in the values and understanding driving the introduction and use of technologies into classrooms. At policy level, the focal point for defining how primary schools should guide and support children's engagement with online devices was the emerging National Curriculum, which was being finalised when this study began (DfE, 2013).

Curricula are influential because by framing things in certain ways they shape beliefs about what counts in society's past, present and future (Potter, 2013a; Williamson, 2013). Advocates of both media education and new literacies have long fought for definitions and space within the curriculum. On the one hand there are those who believe media education to be an entitlement for all, but who feel that, since its inception in the 1980s, media education has been undervalued and sidelined in wider education discourses and policy (McDougall & Livingstone, 2014; Parry, 2011). On the other are those challenging the narrow view of literacy as defined in the national curriculum, where there is still a strong emphasis on print literacy as an autonomous state (Burnett, 2010) and where '[b]ecoming literate' is therefore about acquiring a predetermined set of skills (Potter, 2013a). The newly defined Programme of Study for Computing, which came into force when this study began, replaced previous guidance on ICT and introduced a new focus on computer science from the earliest years. This made it a statutory requirement for schools to teach what the accompanying guidance materials referred to as 'digital literacy' (Berry, 2014) from the earliest years, meaning that for the majority of children it would be part of their education to be engaged with using and understanding the internet. However, some expressed concern that in spite of (or perhaps because of) this, there was little evidence elsewhere in the curriculum that digital technology would have any impact on what or how children are expected to learn. Attention was drawn, for example, to the fact that the curriculum for English explicitly mentioned "books" 60 times, but made no reference to the "Internet" or words such as "digital" or "media" (Twining, 2014), and analysis of the Primary Curriculum revealed that neither of the words critical or reflective appeared, and 'discerning' appeared only once in the KS2 descriptor "be discerning in evaluating digital content" (DfE, 2013). This left media educators still asking "how, and in what spaces within the school, can we introduce critical work with media … when the narrow, fossilised vision of literacy as a set of technical skills, disconnected from culture persists?" (Potter, 2013b). One area of interest therefore was whether by placing it in the context of Computing, an opportunity for developing more holistic view of reflective engagement with online devices would be enhanced or diminished. This made it an interesting time to begin my study.

Whilst the curriculum plays a large role in how children's perceptions and practices might be shaped in school, there is also variation in how curricula are operationalized in local contexts. Turning to the classroom itself, just as in the home context, there are cultural values that play a part in shaping children's practices. At the level of teachers themselves it would be expected, as with parents, that individual biographies and beliefs influence their confidence and willingness in mediating the use of devices. Many teachers report lack of confidence in their own ability to use digital devices effectively in the classroom (Flewitt, Messer, & Kucirkova, 2014), others may be active participants in digital environments in their own lives, but see such practices as inappropriate within classroom environments (Burnett, 2011), some "promote certain types of internet use (mainly information gathering from [homework] assignments), although they are less likely to promote activities such as content creation" (Hasebrink et al., 2011, p. 64) and some are simply unaware of what media literacy is (Avery, McDougall, & Pritchard, 2011). This potentially creates a situation where "the opportunity for a child up to the age of 11 to experience media education in school is determined by the interests of teachers" (McDougall & Livingstone, 2014, p. 13).

Some teachers recognise the importance of trying to accommodate home practice but in reality find this difficult (Cremin, Mottram, Collins, Powell, & Drury, 2012). Other studies suggest that teachers' perceptions of children's engagement with popular media are inaccurate – they overestimate the time they spend on computers and gaming, underestimate the time families spend on activities relevant to the classroom activities and are unaware of many of the popular media narratives children engaged with (Arrow & Finch, 2013). In contrast, there are clearly many teachers keen to embrace the knowledge and practices children bring in from outside (Bailey et al., 2012). One study that looks in depth at the 'funds of knowledge' (Gonzalez, Moll, & Amanti, 2005) teachers themselves bring to the classroom, characterizes two different types of digitally savvy teacher: serious solitary and playful social (Graham, 2012). The study paints three individual portraits of teachers to illustrate this. The serious solitary has actively sought out training courses to make up for her lack of digital interest in her personal life and in order to bring technologies into her

classroom. Of the playful socials one has played computer games from an early age and takes pride in having picked up technical expertise; and for the third digital worlds are central to life at home. The study shows that "the serious solitary teacher brings digital practices in to the classroom, but fitting existing ways of teaching. In contrast, the playful social teachers bring new ways of knowing about digital worlds into classrooms" (Graham, 2012, p. 133). However, these new ways can be frustrated by outdated equipment and practices. Through these case studies, this study reminds both that the commitment and diversity of teachers that should not be forgotten and that they are operating within constraints.

Pedagogical tools and interventions

The most direct level at which classrooms try to encourage and support reflective engagement around online devices is through pedagogical strategies. However, despite the belief that young children require significant scaffolding to guide and inspire their positive, safe, and age-appropriate uses of technology (Takeuchi, 2011, p. 16) there is very little existing research on specific pedagogical interventions with younger children. In the context of the primary classroom, with some noticeable exceptions, media education remains peripheral (Parry, 2010, 2011, 2015). Studies of good pedagogical practice tend to come from research-led interventions or action research by innovative teachers.

One thing that has been found is that there are sometimes mismatches between taught versions of reflective practice and the realities of children's lives. In one study with slightly older primary children, although three quarters said they knew how to stay safe online using their computers and mobile phones, only a third were able to offer responses that corroborated with 'official notions of e-safety' (Cranmer et al., 2009). Whilst most pupils recognised the need to be mindful of dangers, their actual experiences of risk tended to be described in terms of operational problems. Other research also expresses concern that pedagogical interventions focus on dangers faced by older children and misses the more ordinary, age-related risks faced by younger children (Nansen et al., 2012). Some research shows however that with age appropriate frameworks children are capable of grasping concepts to help them

be reflective about their online use. One intervention used a "potential dangers" chart with 5-8 year olds in order to explore their understanding of what might make online information problematic (Ey & Glenn Cupit, 2011). In some cases these children recognized that not everything on the Internet is true and that writing a word in the search box will not take you to what you are looking for straight away. In response to a question about pop-ups many were able to identify reasons why clicking on a pop-up might be dangerous, giving answers like 'they just want you to buy something' and 'it might take you to a rude picture' (Ey & Glenn Cupit, 2011, p. 60). This suggests that for some children at least, important concepts regarding online information had been grasped

As has been highlighted previously, caution has long been urged in media education, against a demystification approach to the study of media, where pedagogical practices encourage little more than "'play[ing] along' with teachers' critical approaches to analysing [media]' and "are little more than an exercise in 'guessing what's in teacher's mind'" (Buckingham, 2007, p. 162). Here the teacher's role would be simply "to reveal hidden ideologies, arming children against the negative impacts of the media" (Parry, 2015, p. 2). As an alternative some educators have sought to try and find more holistic ways of engaging children in reflective practice through building on the range of literacy practices undertaken by pupils in out-of-school contexts (Parry, 2010), developing playful ways of immersing children in alternative digital worlds (Colvert, 2009) or creating more real-world opportunities (Waller, 2010). Whilst these indirectly invite and scaffold reflection about the affordances of online devices for learning (and pleasure) they do not actively support critical reflection about how the online world 'works'. For this, however, there are several enlightening examples that come from the only large-scale, systematic research project looking at media literacy progression in primary schools and what children of different ages might be expected to understand about media (Parry, 2011, 2014, 2015). Across this project, researchers and teachers engaged together in action research. In two separate interventions using different pedagogical strategies it was shown that children could be supported to engage reflectively with media practices. The first intervention simulated a news production scenario with Years 3 and 5 and the aim was to facilitate exploration of issues around the regulation, ownership, control and economics of media

production (which comes under the key concept of 'institution' in media education frameworks). In this simulation the children were encouraged to enact unfamiliar roles and navigate complex situations independently: they "gathered and presented news but they also set and enforced the rules of regulators and bought and sold advertising, resulting in an embodied set of encounters, in turn producing debate and raising questions" (Parry, 2011, p. 70). In particular two students were assigned the role of 'regulating' production, which led to some interesting reflection about and 'policing' of trustworthy information. It was found that this "experiential exploration" posed meaningful ethical dilemmas enabling the children to not only understand "the news 'as it is' but also imagine how it could be otherwise" (Parry, 2011, p. 71). In the second intervention, a Year 2 class was given their first experience of being formally taught to read media texts using a Coca-Cola advert. This advert was selected because it is almost entirely a visual and aural text with very little written language. As such it represents an interesting example in terms of developing visual criticality. Here the main aim was to help the children "systematically explore and reflect upon their cultural responses to advertising, recognising the complex and affective process involved in reading adverts" (Parry, 2015, p. 3). The key pedagogical strategy here was around questioning. On the one hand, open questions were asked about the ways in which children enjoyed, understood or were puzzled by what they were watching, on the other the children themselves were encouraged to generate their own questions. These questions in turn prompted them to pay close attention to details. On the second round of watching they started to notice things they had not seen previously, and which troubled them, such as a bee with a tattoo and a gold-toothed gangster. In so doing they started questioning some of their initial readings of the advert as fun and magical, and instead started to see transgression: "Far from being tutored to adopt the interpretation of the teacher, the children and teacher entered into a dialogue, simultaneously noticing different elements and questioning why they were there" (Parry, 2015, p. 8). A key finding from this study is that a good way of encouraging reflective engagement is to scaffold the development of a questioning state of mind towards the way things work. This is effective when it builds on children's existing knowledge and practices acknowledging pleasure and making space for an exploration of their own affective responses. Synthesising across these

and other interventions Parry argues that linking children's own observations to questions informed by the theoretical framework of media literacy can increase criticality but that enabling this kind of questioning state of mind requires high-level skills on the part of the teachers. Returning to the present study, what the research suggested therefore was that in terms of pedagogic strategies for encouraging reflective engagement there was a balancing act to be performed between acknowledging pleasure and encouraging a questioning state of mind and that the media literacy "toolkit" still had something to offer in this context.

Material environments

It has been argued that the 'domestication' of technology in the home environment shapes children's engagement. The same could be argued in a school setting, where the materiality of the classroom environment itself can both model and mediate. For example, in terms of modeling, in one study of pre-schoolers engagement with technology it was found that if children observed teachers using a computer in the classroom setting for "authentic tasks such as label making or writing the newsletter" it helped to develop cultural awareness, even though it was not being specifically taught (Plowman & Stephen, 2007). The material conditions of the classroom however also made mediation more problematic as the placing of computers in 'safe' places, for example away from sand and water, meant they were often not easily visible to teachers. Although the latter were used to "providing highly contingent responses to children … this did not extend to children's play with ICT: most supervision consisted of overseeing turn-taking and ensuring that children did not cause damage" (Plowman & Stephen, 2007, p. 15). In contrast to this study, where the focus on allowing free play was seen as another reason why teachers might be less interventionist in shaping children's technology use, a year-long ethnographic study of children in Year 9 of secondary school raises a different set of issues around the modeling of the affordances of connected technologies (Livingstone, 2014b). In this study it was found that in spite of the constant engagement with a Smart Board, this was mainly used for one-way communication and "[r]arely were its interactive features employed – for student input, collaborative work, blogs or remixing of curriculum materials" (Livingstone, 2014b, p. 61). Where the networked capacity of technology was more routinely employed was through the use of SIMS (the School Information

Management System), which monitored attendance, behaviour, and achievement. Through use of this standardized, commercial product with its focus on quantifying learning, the author argues that in this classroom both teachers and young people's engagement was shaped by a "shared teacher-learner discourse of performance management" (Livingstone, 2014b, p. 61). Whilst these studies both focused on children outside the age range of the present study, they highlighted issues in relation to the material shaping of classroom practice that seemed interesting to consider.

Turning to the primary classroom, a further interesting use of a spatial lens can be found in new literacies research, where a focus on looking at the 'classroom-ness' of digital technology use invites interesting ways of thinking about engagement with devices (Burnett, 2013b). At one level, research from this perspective pays close attention to the concrete details of actual practices, looking at the way children respond to the material affordances of equipment in the specific space of the classroom. One way this shapes engagement is that is challenges the focus on devices as individualized spaces. Unlike working on paper, or using devices at home, working on screens that are upright rather than flat on a table is more public in the classroom and although "learners may have personalised folders to save their work but these sit alongside the folders belonging to other children and their teacher" (Burnett, 2011, p. 12). The increasing portability of devices is also having an impact on how children engage with them in the classroom. One action research study, in upper primary classrooms, notes the way that at various points children's engagement with devices led to them using the physical space differently, for example, moving tables to form different groups, lying on the floor to work, carrying machines from one place to another including outside: "given freedom and choice as to how and where they worked the children seemed to redesign the physical space in the classroom [in a way that] mirror[ed] computer use at home" (Bailey et al., 2012, p. 5). The researchers note this as "especially interesting when considering the traditional layout of ICT suites, with computers arranged in an ordered manner next to each other" (Bailey et al., 2012, p. 5). They also note that this physical movement in the classroom seems in turn to create new learning opportunities. For example, use of a shared Google document to compile arguments for and against wind turbines, led to one child

going in search of debate every time a new comment appeared in real time on the screen and ending up "miming how the turbine could 'block the radar', something that would have been difficult in the tight space around the laptop" (Burnett, 2011, p. 14). These researchers therefore argue the need to consider changes in classroom organisation to enable chiidren to interact in different ways make space and time for 'embodied meaning-making' (Bailey et al., 2012).

At another level, research that focuses on classroomness emphasises that although on-screen activity always happens in the physical environment of the classroom, this space is 'framed' at a higher level by decisions made in other times and places. For example, external management of school firewalls can impose boundaries around classroom use that curtail opportunities for spontaneous use and the collective nature of computers means they lack the customization of home devices (Burnett, 2013b). Looking at children's engagement through the lens of materiality and classroomness offered potentially exciting new ways of thinking about how to support reflection.

Socio-emotional practices

Finally, I will turn to what can be learnt from paying more attention to the socio-emotional sphere of children's practices and interactions around online devices in school. Starting with pre-school children, studies have shown that rather than more direct pedagogical strategies, it is often "through physical manifestations of pleasure in learning or the simple act of physical presence providing reassurance to a child trying a procedure for the first time" that dispositions to learning are shaped (Plowman & Stephen, 2007, p. 18). In the primary classroom, by analysing peer group interaction around digital literacy 'events', it emerges that reflection around online practice is often constructed with peers rather than taught by teacher. One example of this is in study of copying and pasting, mentioned earlier, where it was found that pupils often shared, approved or rejected texts by reading aloud and commenting on them, a process that was augmented by what she describes as "technology driven recaps" – a practice that the children developed where they recorded bits of texts that each other found as voiceover for their presentations, and then listened to each others as a way of appropriating them (Rasmussen, 2009). By following children's trajectories it is possible to see social practices emerging

that resist superficial explanations. For children and adults alike the social practices evolving in tandem with the evolution of the internet mean norms are in flux (James, 2009; Weigel et al., 2009), there is no rule-book for good use and it is often young people who are at the forefront of these changes (Davis, Katz, Santo, & James, 2010). In supporting reflection therefore it is crucial to pay attention to what children are doing together.

Another study suggests the importance of looking at ephemeral and incidental actions and interactions that occur as children go about their everyday digital tasks (Burnett, 2013a) arguing that the visible and shared nature of classroom devices makes a difference to how children draw on their affordances and this "may or may not coincide with what educators have in mind" (Burnett, 2013a, p. 6). On the one hand, it reveals that children are often operating 'under the radar', for example "angling their laptop lids so that their on-screen play (e.g. continuing to explore a program when they should have moved onto another task) was not visible" (Burnett, 2013a, p. 5). On the other it highlights the social aspect of engagement with the screen, showing how the visibility of screens can lead to playful practices spreading across the classroom or general banter when someone accidentally does something (liked renaming an icon 'lentil') on the shared network. For some children, it is argued, establishing a position within the social group matters more than completion of any task, and this is the primary driver of interactions around the classroom screen (Burnett, 2013b).

Just as is in the home therefore, the shaping of engagement around devices emerges as a process of negotiation

Contribution to research

In 2013 when this study began, whilst it was possible to piece together a picture of young children's practices at home and at school from across a number of disciplines, detailed qualitative data was very scarce. Most research focused on older children (9+) or pre-schoolers and very few studies had explicitly studied both contexts. There was a clear gap in the research concerning the 6-8 age group and scholars from different fields were calling for more attention to be paid to these children's lives (Ey & Glenn Cupit, 2011; Holloway et al., 2013; Nansen et al., 2012; Selwyn, Potter, & Cranmer, 2009).

I hoped to make an original contribution to knowledge by offering a holistic and grounded characterisation of 7 year-olds emergent practices and reflection that drew together varied aspects of context shaping their engagement
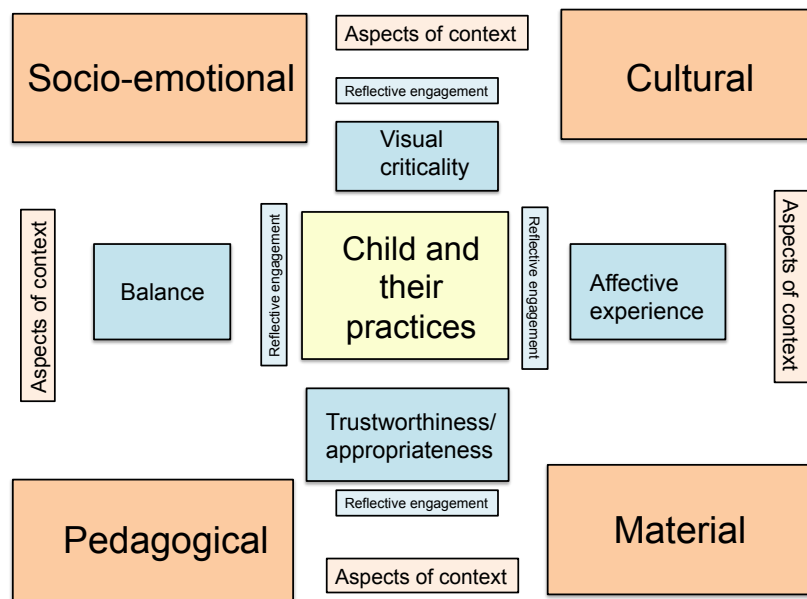
Figure 2: Aspects of context shaping reflective engagement, based on literature

To this end, I designed the above model (Figure 2) as a heuristic device for looking at both home and school, in relation to the following research questions:

RQ1: What characterises 7 year old children's practices with online devices?

RQ2: How do different aspects of their contexts shape their engagement with online devices?

RQ3: What characterises emergent understandings of and reflection on engagement with online devices?

Together these were intended to answer the overall question:

How might parents and teachers support young children in having reflective engagement around online device?

Chapter Two: Methodology

This study was motivated by a pragmatic desire to produce knowledge that would help parents and teachers take a more informed approach to encouraging reflective digital device use. However, this ambition was tempered by discomfort with positioning myself as "expert" and by having a view of social realities as complex, nuanced and constantly changing. It has been reflected back to me that in fact there is an emancipatory element underpinning this study - one that not necessarily aims to teach people, but at least make people (teachers, parents and children) more aware. I did not consciously embrace an emancipatory framework as an approach, but as I reflect now, the decisions I made can be best explained by acknowledging that whether I realised it or not, a critical stance underpins most of what I did.

Assumptions

In the beginning this study was informed by particular epistemological beliefs, perspectives on children and childhood and understandings of learning and development. Implicit in my thinking was also a certain view of literacy I had never previously thought to question (for this see the Literature Review). Some of these remained constant in the course of my research; others were challenged, with implications for the ways I articulated my research questions and conceptualised my findings. I will outline here the basis on which my research design was constructed and return to some of the ways in which I came to see things differently at the end of the chapter.

Constructing knowledge about social realities

The decisions I made about research design were informed by beliefs about any epistemological claims it might be possible to make about social realities. The first was that that all social practices are situated. Therefore any descriptions or explanations of them need to be nuanced and contextualized: "Placing explanation at the centre of enquiry reflects an interest in the complexities of how and why things change and work as they do in certain contexts and circumstances (rather than, for example, what causes what)"

(Mason, 2006, p. 19). The second was that the construction of knowledge in the field of social science is collaborative and dynamic. The purpose of research is not to discover the "truth" about "reality", but to participate in a network of critically and empirically informed conversations in a continuous process of knowledge creation. As Mason suggests, an argument needs to be a "*relational* process, in which the researcher is continually thinking about and engaging with those to whom the argument is being made as well as … the grounds on which they think the argument stands" (2002, p. 173). The third is that social 'realities' need to be seen (and heard) from multiple perspectives. Mason argues that there are four ways of making an argument, all of which are based on implicit epistemological claims: arguing evidentially, interpretively, evocatively or multi-vocally (2002). The one that most closely articulated my intent was arguing "reflexively or multivocally", where a researcher claims their argument has value because it raises awareness of a meaningful range of perspectives, experiences and standpoints, including the researcher's own and is willing to critique and question all of these (2002). In terms of the latter, I acknowledged that any knowledge constructed in the course of the study could be influenced by my own thoughts, beliefs and values. As a mother and former teacher I came to this question from a particular standpoint and it was important to recognise this, rather than find a way of minimizing it. To sum up, I saw knowledge creation as a dialogic process.

Perspectives on children and childhood

The decisions I made were also shaped by work in the sociology of childhood (Corsaro, 2011; James, Jenks, & Prout, 2014) which refutes normative models of children as apprentice adults moving in stages towards adult competencies and instead conceptualizes children as independent, competent actors who have agency in creating their own social worlds and relations within the boundaries of their experience. From this perspective children are seen as "experts in their own lives" (Clark, 2004) and research acknowledges that "children have particular understandings of their world, their own perspectives on their experiences and that they make choices between activities based on individual preferences" (Stephen et al., 2008, p. 100). They are not passive recipients of the affordances of computers or other technological tools and materials but can act upon them, often in collaboration with peers and adults in

a relationship that is mutually constitutive (Marsh, 2010; Plowman et al., 2012). The changing attitudes towards notions of children's "competence" that have evolved from the sociology of childhood have given rise to different ways of researching with children (Kellett and Ding, 2004). Many people suggest that the best way adults can gain access to the ways children perceive the world is by encouraging greater participation by children themselves: "the more children are given a primary research voice, the less adults will be required to 'interpret' their worlds" (Kellett & Ding, 2004, p. 172). It was my intention that where possible my participants would be given an active role in co-constructing the narratives and theories about their lives.

Ecology as metaphor

Finally, as I have touched on in my literature review, my decisions were informed by ecological perspectives on development (Bronfenbrenner, 1979; Rogoff, 2003) that emphasize the need to understand the multiple contexts that children experience, and socio-cultural perspectives on learning (Vygotsky, 1978) that see learning as mediated in these contexts through interactions with tools and artefacts, through relationships with more experienced others and through the practices, values and beliefs embedded in the environment itself (McPake et al., 2013). These ways of looking are brought together in the eco-cultural approach (Tudge, 2008; Weisner, 2002) and the learning ecologies framework (Barron, 2006, 2004) both of which had been used by researchers investigating similar phenomena. These shaped my thinking about research design, in particular where to place the boundaries around my research. Researchers using the former argue that development is influenced by "patterns of cultural activities that individuals experience and that these … reflect the values and expectations, resources, relationships, tasks and emotions that are implicit in the situation" (Stephen et al., 2013, p. 151). Research in this vein highlights the interactions between people, places and things and interrogates how these are interwoven with the values and practices that permeate family life and everyday activities. The latter is a multi-contextual framework for empirical research that helps identify specific kinds of learning opportunities and the 'critical interdependencies' between them (Barron, 2004). Researchers taking this approach define a learning ecology as "the accessed set of contexts,

comprised of configurations of activities, material resources and relationships, found in co-located physical or virtual spaces that provide opportunities for learning" (Barron, 2004, p. 5).

Both these ecological frameworks place children at the centre of their models and when I began, I felt they offered helpful ways of thinking about how to visualise the boundaries around my own research. However, as I engaged more with the literature around literacy as social practice, I started to feel conflicted as to whether an individual-centred, contextualist perspective was the most appropriate use of an ecological model. I will return to this at the end of chapter.

Research design

Bearing these assumptions in mind, I sought to create a research design that would allow for close attention to nuanced contextual data, multiple perspectives and the potential for co-construction with participants. I felt that a case study offered these options. This qualitative approach involves investigation and analysis of a 'real-life, contemporary bounded system' (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information . . . and reports a case description and case themes' (Creswell, 2007, p. 73). Case study research is committed to "studying the complexity that is involved in real situations" (Thomas, 2011, p. 512) and to preserving "the multiple realities, the different and even contradictory views of what is happening" (Stake, 1995, p. 12). In exploring the complex interaction of many factors in few cases it creates a rich, in-depth explanatory narrative (Thomas, 2011). The case study can also be responsive to change, with its multiple data collection and analysis methods being shaped by context and emergent data (Stake, 1995). In some respects these qualities are similar to those offered by other interpretive methodologies. What a case study offers that is unique is its focus on the case as 'a specific, a complex, functioning thing' (Stake, 1995, p. 2). It involves 'careful and in-depth consideration of the nature of the case, historical background, physical setting, and other institutional and political contextual factors' (Stake, 1998). This holistic perspective therefore seemed an apt choice for a study in which an ecological lens was being used. Indeed, this was the research design used in a

range of studies exploring similar ideas (Barron et al., 2009; Plowman et al., 2012; Stephen et al., 2008; Takeuchi, 2011).

Integrity of case study

Within the case study framework there are different decisions to make, each of which have implications for the epistemological claims that can be made (Hyett, Kenny, & Dickson-Swift, 2014). In particular I made conscious choices about the purpose, sample and boundaries of my cases that I felt were consistent with my ecological and dialogic perspective on knowledge creation.

Within interpretivist case study there are three commonly recognised variants, each of which implies a different purpose: the intrinsic, the instrumental, and the collective (Stake, 1995). The intrinsic case is used to understand the particulars of a single case, rather than what it represents (Hyett et al., 2014). The case is of interest in its own right. An instrumental case study is used to gain insight into an issue: "we will have a research questions, a puzzlement, a need for general understanding, and feel that we may get insight into the question by studying a particular case … Case study here is instrumental to accomplishing something other than understanding this particular [person]" (Stake, 1995, p. 3). Finally in a collective case study one issue or concern is chosen, but the inquirer selects multiple case studies to illustrate the issue. In these case studies the inquirer often purposefully selects multiple cases to show different perspectives on the issue (Creswell, 2007, p. 74). All these types of case study can be found in the existing literature on children's digital literacy practices. McTavish uses intrinsic case studies to explore an 8-year old's informational literacy practices in and out of school and to "probe deeper into the finer details of these boundaries" (2009, p. 8). In contrast, Marsh uses an instrumental case study of a 4 year-old boy at home and at school over a specific period to shed light on the wider issue of home digital literacies not being recognised in narrow definitions of literacy (Marsh, 2015). More common in research on children's use of digital devices are collective case studies (Facer et al., 2003; Nansen et al., 2012; Stephen et al., 2013; Takeuchi, 2011). This was the approach I felt was most appropriate to my questions.

Sampling

One decision that needs to be justified in order to give consistency to the epistemological claims of the study is the choice of case itself. In some instances, constraints of time and access can mean this decision is made pragmatically (Ey & Glenn Cupit, 2011). Thomas refers to 'local knowledge case' and argues these have value because "[i]n one's own place of work, one's placement, or even one's home, there will be intimate knowledge and ample opportunity for informed, in-depth analysis" (2011, p. 514). As Stake puts it "selection by sampling of attributes should not be the highest priority. Balance and variety are important; opportunity to learn is of primary importance" (Stake, 1995, p. 6). However, in the majority of cases purposeful sampling is the starting point. Within this a range of possibilities exists (Creswell, 2007) and, depending on the purpose of the study, some cases do a better job than others.

Whilst disagreeing with the idea that any case can be 'typical', Thomas suggests that it is possible to aim for 'exemplary knowledge' - knowledge that exemplifies the analytical object of the inquiry. This can be done by choosing either a 'key case' of a phenomenon or an 'outlier' (2011). In a study by Barron et al. for example, the rationale for sampling at the extreme of a distribution is tied to the theoretical project of "describ[ing] some of the social practices that support new media production skills, with the eventual aim of inspiring the design of environments that can bridge divides" (2009, p. 57). That study therefore purposefully samples participants who are already highly engaged in online production activities (Barron et al., 2009) and focuses on the ways that parents instrumentally support their children. On the other hand, Takeuchi's case study is an example of a 'key' case: two 8 year old girls are chosen because 'this seems to be when interest in and, consequently, time spent with digital media increases … because masculine images of gamers and hackers still dominate portrayals of the "digital native" [and because] kids in this age range spend most of their technology time at home' (Takeuchi, 2011). For another example of key cases, it is clear from the literature that a "digital divide" exists which in many ways maps onto existing social inequalities (Helsper, 2011). Some case studies therefore deliberately try to sample from more disadvantaged communities. In her study of the techno-literacy practices of 0-5

year olds Marsh samples from white, working class communities with high levels of poverty and unemployment which she recruited through Sure Start because there was a particular lack of knowledge about these families (2004). In their study of parents' perspectives on technology and learning in the home, Hollingworth et al. recruited parents through a wide range of organizations to ensure that the research did not only include those already engaged with schooling or technology but also those parents who may be classified within policy terms as 'hard to reach' (2011).

In collective case studies, attention also needs to be paid to what claims can be made about the benefits of studying more than one case and in particular to the notion of generalization, which interpretive researchers qualify in particular ways (Thomas, 2011). For example, in the area of educational research, where it is claimed that case studies can have an important role to play in informing practice, the argument has been made for 'naturalistic' (Stake, 1995) and 'fuzzy' generalisations (Bassey, 1999). In terms of the former, Stake and Trumbull argue that one of the ways people change or improve their practice is by "adding to one's experience and re-examining problems and possible solution intuitively" (Stake & Trumbull, 1982, p. 1) and that a naturalistic generalization can happen when a case study can provides a "vicarious experience so well constructed that the person feels as if it happened to themselves" (Stake, 1995, p. 86). In this scenario the generalization is personal, therefore made by the reader, rather than the researcher: "Naturalistic generalization invites readers to apply ideas from the natural and in-depth depictions presented in case studies to personal contexts" (Mills, Durepos, & Wiebe, 2010, p. 599). Another qualified approach is what Bassey refers to as 'fuzzy generalizations': "the kind of statement which makes no absolute claim to knowledge, but hedges the claim with uncertainties" (1999, p. 12). Although he also rejects the idea of scientific generalization, Bassey does refer to the potential for replication, arguing that this can "contribute powerfully to the edifice of educational theory" (Bassey, 1998, p. 1).

As an alternative to generalization, Creswell argues for the selection of cases that show different perspectives on the problem, process, or event, called "purposeful maximal sampling" (2005). This is the approach used by many

other researchers in this field. In their study of 7 year olds for example Davies et al. chose case studies that covered a spread of ages, gender and levels of technology use in their exploration of older children's practices with and perceptions of technology in the home (2009) and Facer et al. chose participants who provided diversity in terms of socio-economic background, levels of connectivity and family structure (2003). Where studies choose to select for variation in some form, they all make clear that representing a range of children should not be mistaken for generalisation.

In contrast, Tudge et al. suggest that important insights can also be gained by investigating "children's everyday activities across groups that are not maximally dissimilar" (as cited in Stephen et al., 2013, p. 151). This was the approach taken by Plowman et al. to uncover the ways in which families with much in common '"living within a small radius of each other and in a relatively homogeneous Scottish white culture, also differ in their practices around young children and technology" (2012, p. 35). This approach "challenges notions of the homogeneity of family learning and sheds light on the differences between children with apparently similar backgrounds and how these shape possibilities for learning" (2012, p. 36). The study concludes: "The cases are representative in that they highlight some of the complexities of children's experiences with technologies at home, but we do not claim generalisability for these findings because the particular configurations of SES, availability of different types of technology, attitudes and experiences were unique" (2012, p.33).

In order to design something with methodological rigour I needed to be able to justify my theoretical purpose, my choice of case and sample and the boundaries of my case. In the next section I will explain my initial decision-making and link it to the knowledge generation possibilities I felt it afforded.

My own design

The purpose of my own study was to be both exploratory and explanatory. In the first instance I aimed to provide a rich, holistic description of children's practices and perceptions in relation to the use of internet-connected devices. Beyond this, I hoped to generate possible explanations for the different contextual factors that either supported or were barriers to reflective

engagement, in order to inform future educational provision. I therefore saw my case study as instrumental. In terms of my theoretical stance, I was informed by Bassey, who believes "theory seeking and theory building" can be iterative phases of the same study (1999) and by Stake's recognition of the interplay between etic and emic issues: "the issue statements may not fit the case circumstances well and need repair. Issues evolve. And emic issues emerge. These are the issues of the actors, the people who belong to the case. These are issues from the inside" (1995, p. 20). This approach allowed for the analytical focus of the study to be emergent: "As a study proceeds the inquirer should be asking the question, "What is this a case *of*" over and over as evidence accumulates around potential explanations or "theories" (Thomas, 2011, p. 515) As such I started with open questions, which became more refined as the process evolved.

Nonetheless I acknowledged that whether the analytical focus was emergent or set at the outset, selection of the case and its boundaries still needed presenting as a convincing argument (Merriam, 2009). Using Thomas's terms, I chose 7 year-old children in line with other research which argued that this is around the age when interest in and time spent with digital media seems to increase (Gutnick et al., 2010), because there was a gap in the literature for children of this age (Holloway et al., 2013), because of the exponential rise in tablet use in young children and because of the introduction of the new National Curriculum for Computing. In line with the ecological perspectives outlined above, I conceptualised the boundary of each case as the people, places and things that made up children's learning ecologies across home and school. I felt this would complement the approaches taken by Facer and Davies in valuing a rich analysis of the child's home context but take it further by seeking data from another life setting.

I felt that a collective case study had the potential to shed more light on the object of my study because so much was still unknown about the actual practices of 7 year olds. In terms of sampling I intended to apply the 'maximal purposeful sampling' outlined by Creswell in the hope of finding a diverse range of participants, and my intention was that these would be 'key' rather than 'outlier' subjects. Unlike Barron, I wanted to see things as they are rather than

identify exemplary practice. In addition my intention was to work with children from different schools because I felt this would potentially give me interesting data about the different ways in which attitudes towards online practice were shaped in the school context. I thought this would allow for both within-class comparison and also cross comparison at the school level. This was the approach taken by Facer et al. (2003) and Kuiper (2007). However, I acknowledge that in following this model there was a danger of sacrificing depth for breadth, and that more interesting results could have been gained by choosing more children from the same class, thus offering the potential for more dynamic data gathering. As a result of these deliberations the research design I constructed was a collective case study of the learning ecologies of sixteen 7 year-old children from four schools across Exeter. Although I began like this there was inevitable attrition. What emerged after the recruitment period was slightly different, but in many ways better. Ultimately, I moved towards seeing the greatest value of my approach being the analysis of variation in a local area.

Recruitment

I decided that I would recruit my participants via schools because it was integral to my design that the school should be happy for me to be observing in the classroom and speaking with school staff. In addition because I was interested in observing children in schools with differing approaches to using technology in the classroom. I took a holistic view of how contextual factors might influence the development of a critical attitude towards online information practice. I was open to the idea that it might be in schools that did very little online activity that the most critical and creative attitudes towards online information practice were being formed. I was therefore looking both for schools that had been confidently embedding web-connected devices into the classroom for some time as well as those who were just starting to explore ways of doing this.

I decided only to recruit from schools in the city where I live. Whilst acknowledging that this could have limitations (Ey & Glenn Cupit, 2011; Nansen et al., 2012) this was a deliberate choice of local engagement. As well as maximising the amount of time it would be possible to spend with each family and in school, and allowing flexibility (Chaudron, 2015), it was also ethically driven by a sense of commitment, a feeling that this could be the start of

ongoing relationships that made a difference to my community. As part of my approach to schools I offered to provide material and arrange a talk on children and digital technologies if there was wider interest amongst the family's school community and to deliver teacher CPD at the end of the project.

The first thing I did therefore was a basic content analysis of the websites of all the primary schools in the city to get a sense of the diversity of practice - a diversity I was aware of in terms of e-safety provision (Phippen, 2013b) and from my own personal experience of prior voluntary work, research work and through having my own children of this age. Following this I made phone and email contact with all schools (Appendix 2), which I then followed up more persistently with those I felt offered a range of perspectives. Some of the reasons schools gave for not participating were that they were already doing other PhD studies, the relevant teachers were part-time, or teacher workload was too great. From this process I found seven schools willing to participate. I had decided against specifically sampling for diversity in SES, nonetheless I initially picked two schools from economically deprived areas. Realising that there would be inevitable attrition I made further visits to all of these schools. Each school delegated the process differently – in some I met with the Head Teacher, in some directly with the Year 2 teacher and in one with an officially designated community support worker. The level of involvement of various staff had an impact on the continued success of the project.

In collaboration with the respective staff from each school I then proceeded to recruit participants themselves. This was done via parents rather than directly with children themselves (see Ethics for further discussion of this), although in one school the teacher introduced me to the class and told the children what I was doing before they took a letter to their parents. Although this created a temporary burst of enthusiasm, it did not translate into more participation. All schools sent a letter home to parents (Appendix 3), this was then followed up in one school via an e-bulletin, in another through the school newsletter and in another through the teacher talking directly to parents when they collected their children at the end of the day. I had deliberately not involved the school where my own children attend for ethical reasons. However, it became apparent that in the schools keenest to participate I did in fact know some of the children and

parents from my personal network. This slightly influenced the level of take up, because I was personally recommended as being 'a nice person'. Also in this school, one of the administrators had children in Year 2 and not only offered to participate, but also became an important motivator for other parents.

I had initially considered variation in technology use: the children selected should include a spectrum ranging from some who use the internet a lot to others who use it very little. Being pragmatic however, it became clear that to a large extent my sample of children would be influenced by the criteria of 'parent with an interest in reflecting on digital use'. Although it could therefore be argued that this was effectively a convenience sample, those volunteering did nonetheless represent some diversity. As motivation I offered a £10 Amazon voucher, although all the people who eventually did agree to take part told me this had not influenced their decision to do so. At the end of this process I had recruited nine children from four schools. I have described them here broadly speaking as low, medium or high users, based on what I observed and was told about how frequently they used devices and how motivated they were to do so.

School 1	1 x girl (7) with younger sibling (6)
	Medium user
	1 x girl (7) with younger sibling (4)
	Low user
	1 x boy (7)
	High user
	1 x boy (7) with older sibling (9)
	Low user
	2 x boys (twins)
	High users
School 2	1 x boy (7) with older sibling (19) and younger siblings (5,4 and 3)
	High user
School 3	1 x boy (6) with younger sibling (4)
	Medium user
School 4	1 x girl (7) with younger sibling (5)
	Low user

Table 1: Participants

Attrition

I had originally designed for four children from each school, equaling a total of sixteen, but I did not achieve this. I had hoped for more participation from School 4, as this was a school that was renowned for being innovative in their use of technology. Unfortunately, take-up was particularly low and the one family who did agree to participate eventually dropped out because of lack of time. Initially in Schools 2 and 3 there were more families who expressed interest, however for various reasons they did not go through with participation. This meant that across these nine children there was only one school where the possibility existed for in-school comparison. As my data collection and analysis progressed I realized that even with these numbers, the process was becoming cumbersome. In fact, it was in School 1 that I felt the data was richest, because it offered the possibility of shifting the lens slightly onto the community rather than individuals. In retrospect I acknowledge that in adopting the four-school model I sacrificed depth for breadth (Creswell, 2007, p. 76), and that more interesting results could have be gained by choosing more children from one particular school, thus offering the potential for more dynamic data gathering. Ultimately, although I continued to collect data across all four schools, I decided to focus in my analysis on School 1 and one comparison school (School 2), partly because this school was closest in proximity and yet very different in terms of demographic and confidence with technology, and partly because Tom's family (my participating child in this school) offered some interesting counterpoints to the other families I had met.

I will now outline in detail the specific data collection methods I used and a rationale for why each of these was appropriate.

Data collection methods

Multiple methods

Qualitative case study research, as described by Stake (1995), draws together "naturalistic, holistic, ethnographic, phenomenological, and biographic research methods" in "a palette of methods" (1995, pp. xi–xii). Some argue that such

rich design seeks to "eliminate weaknesses and blind spots perceived in one method by using complementary approaches that have specific strengths in such areas" (Barbovschi, Green, & Vandoninck, 2013, p. 23). Indeed, in Stake's checklist of criteria for a rigorous case study he suggests the need to ask whether observations and interpretations appear to have been triangulated (1995). Alternatively multiple methods can be used as a way of surfacing tensions or differences in the way different people perceive things. In relation to my area of interest, for example, researchers point out that "when you ask parents about their children's activities and compare the answers with the children's own accounts, discrepancies are common" (Olafsson, Livingstone, & Haddon, 2013, p. 10). In choosing multiple methods my concern was less for completeness and more for multiple perspectives and potential tensions. As children's perspectives were at the heart of my study, I needed to ensure that the methods I used were appealing and comfortable for them (Mayall, 2000). Like Stephen et al., I was keen to use methods "that include[d] children directly and … made space for recording their experiences with new technologies at home in their own terms, in addition to … adult-centric research questions and concerns" (Stephen et al., 2008, p. 100).

Child-centred methods

In the early stages of developing my research design I was particularly influenced by the Mosaic approach (Clark, 2005), eco-culturally framed ethnographic work (Plowman, Stevenson, Stephen, & McPake, 2012; Stephen, Stevenson, & Adey, 2013) and participatory methods developed in the field of children's geographies (Plowman & Stevenson, 2012; Ross, Renold, Holland, & Hillman, 2009; Stevenson & Adey, 2010) and taken up by researchers seeking to capture "the everyday, embedded and typically ordinary uses of the internet" (Nansen et al., 2012, p. 4). The Mosaic approach was devised as a way of accessing young children's views and experiences of their physical environments. It uses participatory methods such as tours and map–making in order to "begin from children's strengths – their local knowledge, their attention to details and visual as well as verbal communication skills" (Clark, 2005, p. 144). This is then complemented by data gathered using more traditional tools like observation and interviewing. The eco-culturally informed approach recognises that family values and attitudes are not easily observable and uses

a variety of techniques such as autobiographical accounts and photo-elicitation "to understand more about the various discourses and experiences that parents draw on when making choices and judgments about parenting" (Plowman et al., 2012, p. 33). These approaches share a belief in the value of multiple rounds of data collection with different foci, each informed by previous rounds both as a way of building up a detailed picture over time and of involving participants in the process of interpreting the data.

Collection and analysis as iterative cycles

In these approaches data collection and data analysis are iterative cycles mutually informing one another. From this perspective data analysis is "a reflexive activity that should inform data collection, writing, further data collection and so forth" (Coffey & Atkinson, 1996, p. 6). At the outset, I was very keen to build in the opportunity to share and discuss the data I had collected with the children themselves, allowing them to listen to previous responses, reflect on any changes and add new comments (Clark, 2005). This mutual engagement with the initial findings is a process Clark refers to as "visible listening" (2004, p. 147). As well as involving the participants in analysis this can also afford an additional opportunity for data generation. I wanted to do this in a concrete way by creating some kind of artefact which the children could modify and play with in order to portray aspects that were important to them (Olafsson et al., 2013) and choose bits of their own words or pictures which they felt were most representative of how they think and feel.

In addition I thought this might form the basis for a form of data representation that could allow my participants voices to be heard alongside my own. One issue that needs careful consideration in case study research is that of how the richness and uniqueness of the data is presented, or rather re-presented. In other studies of children's use of devices, researchers have used narratives as a way of giving rich description of context (Marsh, 2015; McTavish, 2009, 2013; Plowman et al., 2012; Takeuchi, 2011). Increasingly researchers are also using visual or multi-modal forms, for example comic strips (Bailey, 2016) and in one case Prezi and a specially designed interactive display of 'favourite things' in a panoramic bedroom scene (Berriman & Thomson, 2015). In some cases these ways of representing the data are constructed with or by the participants

themselves. For example, in a study of young children's visual literacy practices (Yamada-Rice, 2010) children were asked to take photos of any visual toys they played with and then were helped to turn these into books. This puts more control in hands of children, although it is not immediately obvious how to analyse the resulting artefacts. The decision of what form any representation of data might take needs to link back to methodological considerations: the extent to which it is important that the data is left to 'speak for itself', the extent to which the form chosen allows for multiple perspectives to be experienced and the extent to which the researcher's own perspective is made clear. I was drawn to the use of more multi-modal forms because it seemed in keeping with what I was studying although I did not fully embrace the idea that the data would be collected and curated by the children themselves. Rather I saw the children's perspective forming one angle or prism. As I will outline below, this was another area of my research design, where what happened in practice was not what I had anticipated.

The broad outline of research methods I intended to use was therefore:

	HOME	SCHOOL
Round 1	Parent semi-structured interview	Contextualising conversation with head teacher Familiarisation with classroom Informal conversations with teachers
Round 2	Child home tour and ice-breaking activities	Observations in classroom
Round 3	Child online tour Sometimes including child-parent interaction	Observations in classroom
Round 4		'Research conversation" in school
Round 5	Child "digital scrapbook" activity	

Table 2: Data collection methods

I will now describe these methods in more detail and what emerged during the various cycles of collection and analysis.

Conversations with parents and teachers

Although my case studies were of children, I initially recruited them through school and parents. I also chose to speak to both parents and teachers before engaging with the children themselves. This was not "to make good perceived shortcomings in the quality or reliability of children's accounts" (Plowman & Stevenson, 2012, p. 539). Rather it was a recognition that "[t]he ways in which adults involve children in family life are central to their learning and development" (Plowman & Stevenson, 2012, p. 539). I felt it was useful to hear how adults talked about children's use because this would contain implicit values. It was also the first step in exploring whether adults and children had similar opinions about the value of online devices or whether there were tensions. In both the home and the classroom it also enabled me to get a sense of place before seeing the child in different environments, addressing the difficulties that can sometimes be experienced in taking everything in at once (Chaudron, 2015).

All of the parental interviews involved the mothers, who in every case except for one had been the initial point of contact. However, in three instances the father was also present for some of the conversation. Six interviews took place during school hours, without the children present, and two took place on a Saturday morning, with the children around. The latter offered different insights into family life and I tried to capture these through field notes immediately afterwards I used a semi-structured interview format to frame these conversations (Appendix 7). The purpose was firstly to get a sense of what, when and where digital interactions took place in family life; secondly to get a sense of the attitudes informing these interactions, by exploring the parents own life history and values. These initial conversations generally lasted between an hour and an hour and a half. Whilst I was there I made field notes about the layout of the house.

The initial conversations I had with the teachers were different in nature to the conversations I had with parents. They were shorter, less formal and less

personal. I broadly followed a list of prompt questions, but this wasn't enough to qualify as a semi-structured interview (Appendix 8). This was partly for ethical reasons (see Ethics) and practical reasons, as it was hard to find similar amounts of time to sit down and have a quiet conversation with them. However, it was primarily in line with my ecological framework, which was focused more on how the classroom itself framed practices (Burnett, 2013b). I saw this being the result of a combination of factors, of which the teacher's own beliefs and values formed a part, but which was also made up of wider school discourses and practices, which I would try and access through observation, document analysis (classroom resources, schemes of work, responsible use policies, school websites, national curriculum) and conversations more broadly across the staff. My intention was that all this contextual data would feed into a holistic picture of children's media ecologies.

Experience sampling and ephemera

A different way in which I thought these adults might be helpful in the process of data collection was as providers of more 'ephemeral' information. One of the things I discussed with both parents and teachers on this first visit was the issue of spontaneous conversations and activities. As a parent myself, I was sensitive to the fact that attitudes and dispositions were shaped cumulatively by the little exchanges families have rather than big sit-down conversations. With my own daughter for example, much discussion of *Minecraft* happened whilst cycling to and from school and spontaneous joint online information seeking usually happened in short bursts, with us looking something up on phone because it came to mind. I was keen to see whether there was any way of capturing this kind of spontaneous, ephemeral moment. At the time I was aware of a few studies where parents had been given responsibility for providing data either in the form of video capture, 'experience sampling' using 'audio journals' or mobile phones (Agosto & Hughes-Hassell, 2006; Plowman & Stevenson, 2012). For example, in her study of parent-child interactions around a tablet Eagle asked parents to make video recordings showing a range of occasions when their children used technologies with other people (Eagle, 2012) and in their study of children's interactions with technological toys at home, Plowman and Stevenson asked families to use their

mobile phones '"to send us combined picture and text messages to provide 'experience snapshots' of their child's activities six times on each of three separate days" (2012, p. 539). In the course of my own study I became aware of other techniques being used in similar ways, for example by Marsh et al. in their study of toddlers use of apps where, in addition to videoing and photographing their children using apps, parents were invited to attach 'Go-Pro' cameras to their children's chests to record naturally occurring episodes of play (2015). Although these ideas seemed appealing (in fact increasingly so), at the beginning of my study I decided against asking parents to gather material in this way primarily because I was worried that this would be too onerous for them. Subsequent studies that have emerged have shown the value of engaging parents as co-researchers (Marsh et al., 2015). If I were to design the study again I would do things differently. At the time, what I actually did was to ask parents and teachers to keep post-it notes of ephemeral conversations and screenshots of activities (parents only).

Conversations with children

The semi-structured interview is generally not seen as the most appropriate method to use with younger children. A comparable study of Year 2 children's relationships with online devices found that the questions "were not children friendly and needed rephrasing or prompting for being understood. Some children, especially the youngest, found the questions too numerous and the interview too long" (Chaudron, 2015, p. 24). As well as the practical challenges involved there are perceived to be many potential problems in terms of quality such as the use of resistance tactics, the difficulty of telling if a child is telling the truth or making something up and acquiescence bias (Hill, 2005). To address some of the power imbalance issues inherent in the research situation alternative methods have been used such as using puppets (Kellett & Ding, 2004) or adolescents as alternative interviewers to the researcher (Barbovschi et al., 2013). To address some of the more practical issues researchers have suggested a variety of techniques (prompts and stimulus) for making conversations with children more engaging, ranging from different card-sorting activities and ranking exercises to timelines and sticker or mapping activities (Bragg, 2007; Olafsson et al., 2013; Stephen et al., 2008). When deciding how to approach my encounters with children I drew from amongst this repertoire. In

addition researchers working with children make logistical suggestions about the physicality of the interview, for example suggesting any sessions are broken up into short activity sessions and that children are given chance to move around (Olafsson et al., 2013). I aimed for all my conversations with children to take place as part of what might be broadly termed a "creative" or "stimulus" encounter.

Child visit 1 - ice-breakers and tours

On my first visit I used two main ways of engaging children in conversation: ice-breaking activities (card game, daily clock) and a home tour (Appendix 6). The former were intended to create a relaxed atmosphere between family members and the researchers; they were also intended to provide insights into the role of technologies in family life, and specific everyday life practices of media use. As part of these activities I gave the children my iPad and asked them to take pictures both of the activities and on the tour. This was intended partly to develop trust and comfort between myself and the children (Chaudron, 2015), but I also intended to use the photos with the children as part of a further round of activity with the children (see below).

The first activity was a card sorting exercise. On the cards were printed photos of different activities children might do at home, including a mix of technological devices as well as non-technological toys. The idea of this was to provide a stimulus for children to talk about the range of things they enjoyed doing and the role that online devices might play in the wider context of their lives (Appendix 6). I asked the children to rank the cards to show their preferred activities. After this I used a timeline activity (Bagnoli, 2009) to stimulate some conversation around children's everyday practices. Using the cards from the previous activity I asked the children to show me when they did particular activities. Whilst these activities were useful for establishing relations and flattening hierarchies – invariably they involved both the children and myself on hands and knees on the floor moving things around and gave children the opportunity to use my iPad - I usually got the sense they were keen to move on to more obvious 'showing' activities. I usually therefore progressed quite swiftly into asking children to show me round their homes.

Much of the research on children's engagement with technology has been informed by work in children's geography and the domestication of technology where home tours are a well-established way of engaging children in conversation (Chaudron, 2015; Clark, 2005; Facer et al., 2003; Nansen et al., 2012). As part of the Mosaic approach Moss and Clark asked children to take the researcher on a tour of their daily life talking about things that matter to them on the way (2004). The children were in charge of where they went and how it was recorded, a process that involved taking photographs and making sound recordings. In another study exploring children's interactions with toys and technology in the home, researchers adapted this method and asked 3-5 year old children to take them on 'toy tours' of the house (Olivia Stevenson & Adey, 2010). These tours involved walking round with the child, "chatting about and documenting" the toys the children had. The children were given digital cameras to take photos of their favourite things and places. Tours are seen as a less 'sterile' way of seeking children's perspectives on their environment (Clark, 2005). They are more appropriate to this age group, building rapport, better than direct questioning, and focusing on here and now rather than relaying on memories and reconstruction of events. They offer "more potential for free-flowing conversation", in the course of which "wider family practices [can be] highlighted" (Stevenson & Adey, 2010, p. 8). In addition "spontaneous interactions and play episodes occurred which added richness to the research encounter that more static methods might not have facilitated" (Stevenson & Adey, 2010, p. 9).

I saw tours of the home as facilitators for conversation with my participants about the relative importance of the internet in their lives, how and when they access it, what they use it for, whether they do it with other people. I had a few prompt questions, which I used when appropriate to steer the conversation. However, I also wanted to allow for spontaneity. I also saw the data arising from these tours being the starting point for further activity. In the Mosaic approach, the photos taken by the children are then used in "map-making" activities, which were a way for the children to bring together the material they have gathered from the tours as a talking point for other children. A variation on this is Berriman and Thomson's creation of 'maps' of children's bedrooms are produced onto which are superimposed images of the children's favourite things

with audio commentaries (2015). At this stage I intended to use the photos as part of a digital scrapbook activity with the children (see below). One issue that emerged was that on some occasions the children (or families) had slightly 'pre-prepared' a setting in anticipation of my visit, for example one boy had pre-loaded a specific *Minecraft* world he wanted to show me. This also happened in Takeuchi's case studies of similar aged girls, where "the girls and their parents set up special play sessions with the intention of giving our cameras something of interest to capture" (2011, p. 58). Like Takeuchi, whilst recognizing that these activities were not spontaneous, I do not think the activities themselves were particularly impacted by my visit. Rather, it highlighted the keenness of children simply to show what they can do.

Child visit 2 – online tour

Repeatedly it is found that the most effective way of gathering data about children's practices and behaviour is simply to let them show you what they do with devices (Chaudron, 2015). Even children as young as 4 and 5 can give important information when they "show what media devices and contents they use and are interested in, how they play digital games, go to use the internet" (Olafsson et al., 2013, p. 20). These kind of informal play sessions can also allow for observation of how children interact with others while using media and so "emphasis can be placed on how a single child deals with the media, or on exposure of a social system in which children are growing up (e.g. family, nursery school, school) to the media" (Olafsson et al., 2013, p. 21).

I have explained previously that I chose not to use methods that sought to capture footage of naturally occurring play or interaction with devices. Instead I decided to ask children to give me an online tour. Whilst this is a more constructed type of interaction - different from simple observation of a child 'naturally' using a device – it creates other possibilities, both in terms of involving the participant as co-creator of the data and in terms of getting a better understanding of their preferences, perceptions and understanding. As Nansen et al. put it: "An online tour enabled participants to provide an inventory of applications and sites regularly visited, as well as their expectations and experiences of these sites" (2012, p. 4).

In terms of how these tours were structured I tried to give as much freedom and agency to the children as possible. I asked them to show me around what they would normally do with their devices, what they liked and what they knew how to do. The fact that most of the children were keen to get to this part of the process was also a sign that this was the bit they found most fun. As they showed me I prompted them a little to 'think aloud' about what they were doing and why. I saw these sessions as contributing to an understanding of their media ecologies – how they navigated, which virtual spaces were meaningful to them, the social relationships involved, their affective experience – but also as providing insight into aspects of their critical digital literacy in terms of skills, understanding and reflection. Where I saw the potential to explore an issue I therefore also asked questions. These questions were informed partially by literature I had read on multi-modal and new literacy practices. However, I did not go looking for specific things. Also, as these visits were quite spread out for logistical reasons, I had usually spent some time in school with the child before visiting them at home for the online tour. This was helpful as it allowed me to see connections between home and school and gently probe how children saw these as connected or not.

Originally I planned to save the online tour for my second visit. The reason for waiting was that by then we would be more familiar, and that it would be better to do multiple short visits rather than one long one to prevent children from becoming bored and also to build up a picture over time. As it turned out the children were usually very keen to show me what they did online (or on tablet) and with all but two of my participants the online tour followed on directly from the previous offline activities. In some cases the family then invited me back on another occasion to observe more online use.

One thing that was of interest to me was to see how children might potentially interact with others whilst using their devices. Where there were tensions I was keen to see how this impacted on practice and how differences were negotiated. In fact, from the beginning of these sessions, the extent to which the parent managed the research process itself offered insights to family practices. There were also occasions where I gently encouraged joint use. Although this

could not be classed necessarily as naturally occurring joint media engagement, it nonetheless gave insights into how such interactions played out.

In terms of capture I had once again considered the option of creating screencasts of these tours. Indeed, one mother in particular was very keen on doing this as both she and her son were already curious about developing games-related screencasts for upload to YouTube. The main reason I decided not to do this was because having researched it myself and sought technical help from the university I was unable to find a simple way of recording screencasts on tablet devices. The software mentioned previously only worked as a simple download on desktop or laptop computers, whereas on tablets it involved a two-step process. This felt too cumbersome and once again I was concerned it would take up too much time and would interrupt the natural flow of events. It also evolved in the course of doing these tours that the children would switch between devices when showing me things. Instead I decided to show all the children how to take screenshots on their tablets or computers, and these were to form part of the scrapbook we would go on to curate and discuss. In addition I made field notes/took audio and video recordings of the sessions.

Classroom observations

In school I aimed to adopt a more 'naturalistic' observation of children's use, simply following what they did. Of all the methods I used this was the messiest to organise, for two main reasons. Firstly, because of the number of children I was following (and the number of schools) and secondly, because of the unpredictability of when 'relevant' activities might be occurring in each of the four different classrooms.

I began by making some basic decisions, which I felt were important in terms of my methodological consistency: when I would visit the classrooms, the role I would assume in the classroom, how I would record my data and what I would look at when I was there. All of these decisions were guided by the overall purpose of the observations, which as I have outlined previously, was firstly to get a nuanced picture of the classroom context and secondly to try and get a sense of how each of my focus children interacted within this setting.

Each of the classrooms I had selected was set up differently, both in a material and a pedagogical sense. In order to try and become familiar with the workings of each classroom I spent time in advance of my actual observations watching how the classes functioned and creating basic maps by taking photos of the visual displays, noting access arrangements to devices and taking note of seating plans and so on. I also gained a sense of the rhythm of the day, how often children moved in and out of the classroom, changed activities and so on. I had intended to do a child tour of the classroom at some point so that I could compare my mapping of the classroom with how they perceived and experienced it. For logistical reasons this didn't happen – I may have been too cautious, but as the only time this could peacefully have happened was at lunchtime I did not want to deprive the children of this time. Instead I tried to slip questions about the classroom environment into conversation when I was observing. These observations, along with my initial conversations with the teachers, also allowed patterns of engagement to emerge. I was interested in two 'types' of activity. On the one hand I was keen to observe any direct instruction relating to online use, for example any e-safety or digital literacy lessons. On the other hand I was equally keen to visit when teachers were using online devices as part of everyday classroom activity. The balance between these types of activity was different across the four classrooms. Whilst in some the computers were used in a very structured way, in others much of the "framing" of computer use was done in an opportunistic day-to-day basis. For some classes I therefore visited when specific lessons were planned using the Internet or teaching about it, with others I realised I would have to spend longer periods in the classroom making more general observations about the positioning of computer use in classroom life. In the end the typical activities that I observed included research-based tasks, quiz making, online Maths games and on a couple of occasions specific e-safety discussions. In addition I also observed some coding lessons.

Once I had decided when to visit I then needed to consider my role in the classroom. I had initially thought of myself as a non-participant observer, in the sense that I was not taking an active role in the classroom. I was introduced as George and given the opportunity to tell the class why I was there. Nonetheless it was not always easy to remain detached from what was going on – my

presence inevitably had an impact on the classroom. On many occasions children directly approached me for help or initiated conversations with me. In some of the classrooms I was previously acquainted with children through personal relationships and they were keen to engage in conversation. Even when I was not, the children were always curious as to why I would be interested in what I was looking at. At the same time, my presence in the classroom sometimes affected the other adults' decisions or behaviour. Teaching assistants often asked for my advice or simply corroboration of whether I had seen something happen. In addition although I aspired to observe typical practice, the teachers sometimes tailored what they did either because they were concerned it wasn't interesting enough for me or because they had a technical hitch and I was a useful way of filling the gap. At the same time, I realised that it was useful for me to be able to talk to the children about what they were doing, as I did at home. Sometimes based on things I had seen at school I asked questions or guided activities at home, in one instance for example encouraging a child to show his parents some coding he had done. Effectively therefore I quickly became a participant-observer.

The decision of how to capture classroom activity was the most complicated and was informed by logistical, ethical and methodological concerns. In the first instance I needed to decide how to frame what I was looking at. In some studies this decision is informed by a pre-decided data analysis strategy – for example multi-modal interaction analysis (Jewitt and Jones, 2005 as cited in Burnett, 2013a). However, unlike classroom researchers who have a clearer agenda of what they are looking for (Kuiper et al., 2008b) I did not have a 'checklist' or observation schedule as such. At this stage my thinking about data analysis was that I was going to conduct a broadly inductive, thematic analysis. Nonetheless, I was very interested in the classroom observations of Burnett, and her focus on observing different 'dimensions of children's engagement with digital texts' – the material (their physical interaction with space, equipment and each other), the textual (their on screen interaction – texts they produced or processes they engaged in) and the connected (their references to other experiences and places) (2013b). Although I did not use this as a direct frame of reference, my thinking about how to look at the classroom was influenced by

it. I was looking for insights in any of these dimensions into how children made choices and judgments about their digital engagements.

Having decided on this broad 'way of looking' I then had to address the issue of who to include in my observation. In three of the classrooms I had only one focus child. However, in one of the classrooms there were six potential children to follow. In the former therefore, I had to decide whether to focus solely on the child or on the peer-network around them. In the latter, I had to decide how I would make decisions about who to follow on any given day. In addition, in this classroom access to computers was sporadic, so I needed to make decisions about what to do if none of my focus children were using them on the days I visited. In part, these decisions were helped by thinking about how physically to capture the data.

Firstly I considered how I would capture what happened on screen during class time. Some researchers use screen capturing software such as Camtasia (Kuiper, Volman, & Terwel, 2008a) or Screencast-O-Matic (Bailey, 2017). I looked into the option of doing this but decided against it primarily for reasons of consistency and preserving the natural flow of activity. For a start the various schools involved had different levels of screen-capturing already in place for the purposes of monitoring. One school, for example, was using Lightspeed and ESafe, which enabled senior management to respond swiftly to any instances of inappropriate use. Although I talked to this school (School 4) about the ethical implications of accessing this data, in reality it never became an issue. In terms of screen capture therefore I decided simply to use video recording to capture what happened. Where possibly I decided to leave a fixed camera on the screen of the computer being used by one of my focus children.

Secondly I needed to decide how to capture the interactions between children, the screens and each other. On my early visits I first of all spent time in each classroom experimenting with video and audio recording. I also looked at what other researchers had decided to do. Burnett, for example, chose not to try and capture interactions using video or audio recording and rather to gather evidence through the writing of field notes, talking to children as they work and conducting group interviews (Bailey et al., 2012; Burnett, 2013b, 2013a; Burnett

& Merchant, 2013). This allowed flexibility, enabling rapid response to changing patterns of interaction. In contrast, video and audio capture allows for the material to be revisited and nuances to be observed. In Schools 2, 3 and 4, where I had only one focus child, I used both methods on the same child. I captured screen activity on video, and interactions primarily through field notes. In School 1 I decided to do a number of things: in each observation I would focus primarily on taking field notes. However, I would also leave a camera trained on a particular computer for the duration of the session. In addition, when more than one child was doing something of interest I would use my phone to audio capture what was going on. Sometimes my field notes and the video/audio footage coincided. At others I would be drawn to another incident happening in the room and therefore the video footage would take place completely in my absence.

There were some ways in which my classroom observations proved challenging – in part these were down to design, in part they were down to the day-to-day realities of working with schools. Firstly, due to having children across four schools my time was spread thinly. This was sometimes compounded because things happened that meant when I got to school there had been a change of plan. Secondly, in School 1 where I was following several children there was always a balancing act to be performed in terms of my attention. Thirdly, sometimes children other than my participants were the ones doing interesting things on the computers, providing me with 'peripheral' data that I was not quite sure how to incorporate. With these challenges, I felt it was important to embrace things as they actually are: to stay when there was a change in plan and to factor this into my explanation of how classroom-ness is constructed, to interrogate why my focus children chose not to use computers (or were unable to gain access to them) and to acknowledge when 'incidental' data influenced my thinking.

Finally I sometimes chatted to the teachers about what I was finding and they gave me their observations. I had not planned to have critical conversations with them, this just emerged. It was often difficult to capture these. What I ended up with was a rather messy collection of data, some of which was planned and some of which was 'incidental'. These observations took place

over the course of six months (from February to July 2015) and occurred in tandem with the home visits.

Data analysis

Stock take

I began my data analysis in a general way almost at the same time I began data collecting. I used NVivo to manage this process and began by transcribing all the home data I had collected (initially just words – although I was conscious that some form of multi-modal analysis might be of benefit) beginning with the parent interviews as they were the most discrete and then going through both the audio and video footage of my child encounters to ensure that I had the most comprehensive coverage of these. With the latter, in the first instance I transcribed the conversations that occurred and then made a separate record of what had happened on screen during the course of the conversation. For each child I also placed any photos, screenshots or records of stimulus activities – timelines, card-sorting activities – into a separate folder on my iPad.

The school data was messier to organise and it took some time for me to get a sense of how it could be usefully categorised. As a starting point I identified how much data I had that was related to each focus child.

	Number of visits	Video data - minutes	Field notes – number of occasions
SCHOOL 1	8 visits of 60-90 minutes each	233	FN taken on all occasions
Will	5	49	5
Lottie	4	45	4
Joe	2	11	2
Anna	2	28	2
Ben	3	30	3
Luke	2	10	2
SCHOOL 2		272	
Tom	8 observations + 1 research conversation	272	9

Table 2: Overview of school data used

The first thing I did was to watch and listen to all the recordings, as although I had been present for some of these, others had been captured whilst I had been elsewhere. From this data I initially extracted those episodes that featured my focus children and transcribed them. In addition I made notes on the screen activity. In my main school, this was to a certain extent the result of chance – it depended on what the children had chosen on the specific days I visited. In terms of the 'incidental' data referred to previously, I selected and saved episodes of interest. I also logged in NVivo my field notes, any emails from participants and any contextual documents.

Taking data back to the participants

I have touched previously on my desire for data collection and analysis to be conducted through iterative cycles. In particular, I was keen to take the data back to the participants, in order that they could play in part in choosing and interpreting the material that was ultimately used in the study. However, this was one area where what happened in reality fell short of my ambitions for the study. Nonetheless both of the following attempts led to new ways of thinking about my data.

'Research conversations'

At my initial planning stage I felt it would be important to allow some time to hear what my focus children had to say about their school experience away from both their teachers and their parents. However, rather than seeing this as a specific follow-up to particular lessons, I decided to reserve this discussion space for towards the end of the school observation period to allow for issues to emerge from the data that would be worthy of exploration. I saw its format as a kind of creatively stimulated conversation, half-way between a focus group and a workshop. Mayall refers to "research conversations", which take place in pairs or groups and are a way of finding what matters to children: "they can control the pace and direction of the conversation, raising and exploring topics with relatively little researcher input" (2000, p. 133). In terms of practical considerations, although some suggest that this kind of activity should take place in a setting non-reminiscent of a classroom this was not really possible (Olafsson et al., 2013). However, I followed advice suggesting that a good

number of children for this kind of encounter is around five (Olafsson et al., 2013) and where I had only one focus child I asked them to choose three friends to bring along.

After some initial familiarisation with the data, one area that presented itself as having the potential to reveal more about how children understood and thought about their use of online devices, was in their "reading" of the screen. At around this time I had become aware of an emergent model of being developed with teenagers (Pangrazio, 2016), which highlighted rhetoric and internet architecture as key aspects of critical digital design. This resonated with my emergent thinking about my data and I felt further exploration could provide an interesting way of looking at the issue of reflective engagement. I therefore decided to design an activity that might encourage the children to articulate for themselves how they understood what they saw when they looked at a screen. This involved talking about icons, what they saw when they looked at a screen and the metaphors they used to describe online practice. To make this more accessible/fun I made a series of word and icon cards for a card sorting activity again (which I also made on Explain Everything) and a sentence finishing activity. Unfortunately I only managed to do this activity in School 2. In School 1 I was thwarted logistically on three occasions: firstly by the late return of the class from a school sports day outing, secondly by some last minute SATs administration and finally by Ofsted visiting in the last week of term. Nonetheless, the contributions made by the children fed into a further round of analysis and coding. This offers one example of how my analysis evolved as part of a conversation between my data, my participants, the literature and my own thinking.

Digital scrapbooks to relational maps

As I have stated previously, my original intention had been that in a final cycle of data collection, I would discuss and edit data from previous visits with the children themselves using what I conceived of as a 'digital scrapbook'. This 'visible listening' (Clark, 2005) would give the children more voice. I envisaged a process whereby the children themselves and I (and perhaps their parents) would curate images and snippets of conversation in a digital form that was easy to 'play with' on a tablet. I considered a number of possible platforms for

this activity (including Prezi, Book Creator, Padlet, Wordle and Creative Book Builder) but initially decided upon an app called Explain Everything. My reasons for this were firstly that it is a versatile app that allows for all different types of media to be inserted very simply. It also had child-friendly features like drawing on the screen and arrows like light-sabers that I thought might appeal to this age group. In fact, once I had spent time with the children I felt that PowerPoint was actually the platform that would be most accessible and interesting to them. Using one of these platforms, I planned to pre-prepare a basic version of how I saw the data and then ask the children to discuss and edit it with me. For example I intended to let them resize things, move them around on screen to highlight their relative importance, record audio to clarify their opinion about something, or match words and pictures. This idea was informed by the Mosaic approach where the photos taken as part of the tour were then made into a book and by the eco-cultural approach, where Stephen et al. used a mapping exercise with stickers as a way of exploring children's perspectives on technology use in the home (2008).

When the time came to start constructing these scrapbooks however, I realised it had some flaws as a method. The first thing I did was to trawl the data in order to try and create a broad visual representation of each child's learning ecology. I then experimented with various visually playful ways of presenting data (Lego maps, collages, screenshot stories and 'critical screenshots') that I thought could act as a stimulus for discussion with the children (Appendix 10). However, what I ended up with in relation to my first two children didn't feel like an appropriate tool for a number of reasons. Firstly, the process was cumbersome: it felt like an overcomplicated way of trying to answer my research questions. Secondly, the amount of work I was doing made it feel disingenuous as a process of co-curation. Finally I wasn't really sure what I was 'asking' of the scrapbook. Was it a way of creating a multi-modal portrait of each child's practices and perceptions? This was reasonable, but risked being a lot of work for something essentially descriptive. Or should I be using it as a way of further exploring the question of catalysts and barriers to reflection in their learning ecologies, which was really at the heart of my study? If so, I didn't feel that the material lent itself to this. Somewhat disappointedly, I realised that although I

liked the principle of this method, I had not really thought it through in relation to my research questions.

Although I initially saw this as a failing in my research design, experimenting with these 'portraits' was actually a very useful one in terms of data analysis. I had conceived of this process as a way of getting a more nuanced perspective from the children themselves, but in fact it emerged more as a thinking tool for me. I realised that the process of constructing these scrapbooks was itself a stage in the analytical process. What began to emerge was the sense that rather than scrapbooks, what I needed were more multi-layered relational 'maps'. I started to visualise something with interactive entry points that could be used as a way of exploring issues relating to the influence of people, places and things. This image stayed with me throughout the analysis process and ultimately informed the way I conceptualised my findings in my Discussion. At this point however, laying bare how messy the data was encouraged me to take a step back and revisit existing frameworks to bring the next round of analysis into sharper focus. I did not discount the possibility of going back to the children, although I think it was at this point that I realised how much work was going to be involved in analysing what I already had, let alone collecting more.

Data audit

At this point I felt it was necessary to take stock and reflect on what I was doing. As a result of these various rounds of data collection methods I ended up with the following data to analyse.

CHILD	ADULT DATA	HOME DATA	SCHOOL DATA
Lottie	Parent interview Emails from mum Incidental co-use during child session	Tour of house Laptop use iPad use Word game	Trouble finding work Maths PP Google Image search Sorting out work at end of term
Will	Parent interview Co-use – playing *Clash of Clans,* making a PowerPoint	Tour of house iPad use x 2 Card game Joint use of laptop with	Trouble logging on Making of a PP over several lessons in group with other boys

	Screenshots saved by mum	mum	Printing out of PP
Joe	Parent interview Incidental co-use during child session	Taking photos of cuddly toys X-Box use Card game Sibling use	Attempt to use PP Incidental chats during other activities
Ben	Parent interview	Tour of house Tablet use Card game Sibling use	Quiz using Excel Maths charts
Luke	Parent interview Incidental co-use during child session	Tour of house Tablet use Card game Sibling use	Several observations of him not getting access to computers Chat about something he has printed out
Anna	Parent interview Emails from mum	Tour of house Laptop use	Group work inserting hyperlinks Chat about school use of computers
Tom	Parent interview	Tour of house Tablet use X-Box use Sibling tablet use	8 lessons during which I observed Tom using the following: Mathletics Infant Encyclopedia Kid Rex Purple Mash PowerPoint "Research conversation" with Tom and 3 classmates
Theo (not used)	Parental interview Incidental co-use Short session where Theo showed parents what he did at school	Tour of house iPad use Card game	2 lessons using Espresso Coding to do some basic programming Golden Time – free use of laptops

	Emails from dad		
Ruby (not used)	Parent interview		4 lessons

Table 3: Audit of data collected

Coding and thematic analysis

To analyse my data I chose to use a thematic approach (Braun & Clarke, 2006) because I felt that rich thematic description of the messy realities of children's lives would provide a firm foundation on which to interrogate and reimagine models of support for reflective engagement. It also fit with my overview of the research cycle as iterative and my desire to find not the right answer, but a helpful answer. Braun and Clark suggest that thematic analysis can be a "recursive process, where you move back and forth as needed" (2006, p. 92) and indeed I went through several iterations, often looking at the material through slightly different lenses and redrawing my conceptual models to try and find a way of making sense of the data as a whole. Although I found the process of looking for patterns richly rewarding, it was this quest for a holistic explanatory model that proved challenging. I will return to this issue at the end of the section.

In an attempt to help interpretive researchers conduct thematic analysis with more rigour, Braun and Clark outline six key phases (2006). Making use of this outline (and referring to some of the many pictures, memos, question maps and code lists I made along the way) I will describe how my own process evolved. However, although I will present it in a staged way, he process of analysis was more protracted and messy than this.

Phase 1: Familiarisation with data

I have described in the previous section how I began familiarising myself with my data in tandem with my first data collection. Through experimenting with a range of ways of creating visual portraits to take back to my participants, using

the broad categories of people, places and things, I was already immersing myself in the data, laying what Braun and Clark argue is the "bedrock for the rest of the analysis" (2006, p.93). During this time I also transcribed my data and combed through the school material I had, identifying episodes relating to my participants, assigning broad descriptions to these and also making note of interesting moments that had been captured between other children. Even whilst transcribing therefore, there was interpretive activity going on. As I transcribed, I constructed a general list of ideas that occurred to me as I read, amongst which there were many overlapping phrases and perspectives. I noted these with no relation to specific questions or literature. They were inductive and inclusive, as I wanted to be as open-minded as possible about the data.

Phase 2: Generating initial codes

Following on from this immersion I then began to more systematically read through and code the data I had for each child. I continued to do this broadly speaking using 'open coding' (Glaser & Strauss, 1967) to see what emerged. I saw these codes as the first stepping-stones in identifying broader themes in the data, and at this stage the list remained long and sprawling. What this phase immediately highlighted was the fact that simple descriptions of 'how children engage with devices' were not going to be possible. For example, finding that 'X uses a device in his bedroom' or 'Y plays *Minecraft'* was relatively meaningless. There is not single way of playing *Minecraft* and no one type of engagement that using a device in your bedroom leads to. When the data from one child suggested a slightly different way of looking, I then returned to previous data and asked whether this offered any helpful insights. The process of coding my data therefore involved several rounds of "conversation" between different participants.

Braun and Clark describe coding as being undertaken in one of two ways, inductively or deductively. Whilst noting "researchers cannot free themselves of their theoretical and epistemological commitments" (2006, p. 88) they argue that process of inductive coding is more data-driven and does not try "to fit it into a pre-existing coding frame" (2006, p.88). In contrast, deductive coding is more "driven by the researcher's theoretical or analytic interest in the area" (2006, p. 89). They suggest therefore that researchers "either code for a quite

specific research question (which maps onto the more theoretical approach) or the specific research question can evolve through the coding process (which maps onto the inductive approach)" (2006, p.88). In fact, although I began with inductive coding, my own process did not fall neatly into either of these categories. It had always been my ambition to bring rich, thematic description of the messy realities of children's lives into dialogue with existing frameworks that might be adapted for supporting reflective engagement. As I explored the data new questions arose which suggested ways of categorising that I hadn't previously imagined. However, being steeped in the literature, I inevitably also made connections with other research that would help explain the data. Coding was therefore neither fully inductive, nor fully deductive. Rather it was an iterative process of moving between the literature, my data and my research questions, interrogating and revising codes (or even questions) where necessary. As a point of clarification here, the model that appears in my literature review perhaps gives the impression that I began with quite a clear framework of deductive codes from which to work. The reality is that this model emerged early on during data analysis.

Although I tried to identify broad categories amongst these codes at this stage I also kept the list open, juggling multiple ways of framing. This is similar to other case study researchers who highlight that their qualitative data set "afforded several options for the analysis of case material" (Barron et al., 2009, p. 57) or that the case study design lent itself to a multi-dimensional analytical approach (Plowman et al., 2012).Thomas suggests that "analytical eclecticism" is a defining factor of case study research (2011, p. 512) and argues that the 'analytical focus [of a case] crystallizes, thickens, or develops as the study proceeds (2011, p. 512).

Phase 3: Searching for themes

It can be tempting to describe themes as "emerging" from the data, however Braun and Clark argue that to use this phrasing is to assign a passive role to the researcher in the process. Rather, they suggest that the researcher always plays an "active role … in identifying patterns/themes, selecting with are of interest and reporting them to readers" (2006, p. 83). Acknowledging that this next phase was therefore a subjective and active process, I then began to look

for potential themes which would help me to develop more of an argument and to collate different extracts under each heading.

Having made a choice to 'freeze' the literature in a certain shape, in this iteration of analysis I was more systematically deductive. I referred back directly to my research questions (making the language of them more precise) and re-interrogated the value of some existing frameworks that I had temporarily lost sight of. I broadly tried to contain this within the framework outlined at the end of my literature review, which conceptualised children's practices being experienced within interwoven 'environments' – material, socio-emotional, pedagogical and cultural – and reflective engagement being anchored around the key elements of trustworthiness, balance, visual criticality and affective experience. One of the things this phase revealed was that there was much to be learnt from what I did not find. For example, some of the issues that the literature suggested were important in terms of reflective engagement were largely absent from my data. This brought to the fore the idea of "catalysts and barriers to reflective engagement" as being a potentially more useful way of rephrasing my research questions. It also reinforced my belief in the value of paying attention to the minutiae of everything I had observed, in order to see things with fresh eyes.

Phase 4: Reviewing themes

Although I felt I was identifying some interesting features of children's (and adult's) practices and experiences, I was also struggling to see how I might move beyond thematic description to make more of an argument in relation to my research question. At this point I decided that writing thematically structured narrative portraits might help the process. I felt this could serve two purposes. On the one hand I saw narratives as ultimately a way of representing the minutiae of my data in an engaging and rich way: similar studies to my own (Marsh, 2015; McTavish, 2009, 2013; Takeuchi, 2011) guided my thinking on this. On the other hand I saw the process of writing them as a useful analytical tool in their own right (Ely, 1997). Trying to shape these narratives, guided by my research questions, helped to surface two particular difficulties I was having. Firstly, I was finding it difficult to distinguish between how children engaged with connected devices and how their practices were shaped in different contexts.

Up to this point I had seen these as distinct research questions but increasingly I began to feel that rather than asking how practices and perceptions were shaped it was better to ask where, when and why reflection was emerging (or not) from a range of relational experiences. This conceptual shift occurred in parallel with the reading around new literacies that I was doing and felt consistent with my emerging understanding of literacy practices as situated and dynamic. Secondly, and related to this, I realised that for some time I had not been able to place the theme of "mutual shaping" that I felt was a key pattern in the data. These narratives alerted me to the fact that finding a way of representing multi-directional interactions - parents shape child, child shapes parents, device shapes parent and so on – was integral to my analysis. The interpretive process of shaping these narratives in dialogue with my research questions therefore led me to start rethinking my conceptual framework away from placing the individual child in the centre.

In trying to make sense of my data, I now created a visualisation that had 'devices' in the middle and around this, three ways of describing how both adults and children might engage with them: their practices, their values and their understanding. Surrounding this was still my "ecological" map of the various "aspects of context" through which these were shaped. I now saw "reflective engagement" more in terms of moments or interactions that might arise at different intersections on this landscape. In some ways therefore my analysis went in full circle back to maps, but in the final instance with more clarity about the map's purpose: to identify what might be catalysts or barriers to those moments. Although this visualisation still felt convoluted, I felt it finally opened the door to the more pragmatic way of conceptualising support.

Phase 5: Defining and naming themes

Braun and Clark dedicate a phase of thematic analysis to the importance of defining and naming themes in a way that is "concise, punchy, and immediately give the reader a sense of what [they are] about" (2006, p. 99). In my own study, I would argue that this phase only became possible once I was able to change my way of visualizing the coherence (or otherwise) of my data. Indeed in retrospect I would say that the struggle to do this was the main story of my data analysis and the key to how I finally arrived at the actually quite simple

themes of practices, spaces, resources and roles. Essentially this involved letting go of ecology as an explanatory metaphor, and was informed (although at this late stage, not theoretically underpinned) by Carrington's concept of 'assemblages'. In this framing:

> There is not a sense of creating and then maintaining a balanced symbiosis of parts. As a result of this heterogeneity and independence, assemblages dismantle and reassemble in different combinations as context and requirements shift (Carrington, 2013, p. 209).

Moving away from the idea of a holistic model of explaining things, towards a more fragmentary and concrete way of addressing things therefore freed my thinking and allowed me to define my key themes in a more confident way. Their simplicity has a pragmatic weight that I do not think I would otherwise have been able to find.

Phase 6: Producing report

My decision to structure the Findings chapter of this thesis around my earlier framework and to move in the Discussion chapter towards the more pragmatic model is my way of resolving the tension inherent in my questions and running through this section. I felt it was important and truthful to represent these two slightly different ways of looking at the data because they reflect the journey I went on and offer different experiences of the data. On the one hand the narratives fulfil the exploratory ambitions of the study, providing rich interpretive data that did not previously exist. I still feel this makes a valuable contribution to knowledge. On the other hand, the nascent mapping of support for reflective engagement, fulfils the belatedly acknowledged emancipatory ambitions of the study.

Ethics

I hope that an ethical perspective underpins my whole study. Indeed I have tried where possible to highlight the ways in which some of my choices were ethically informed. Ethical considerations need to be constantly reassessed throughout the research process; they are not something simply to be dealt with at the

beginning. The BERA guidelines suggest keeping notes on decisions and the reasoning behind them in order to monitor ethical thinking and practice throughout the research process. They recommend this "ethical record-keeping" as good practice for all researchers (2011). In concluding this chapter with an ethics section, therefore I don't wish to suggest it is an afterthought, but rather to reflect on the ethical decisions I made.

To begin with, any research being conducted with children is based on assumptions about the competence of children to take part in research. As I have outlined previously, this study sees children through the lens of the sociology of childhood; that is, as social actors in their own right. Ethically, it relates to the United Nations Convention of the Rights of the Child, emphasising the importance of enabling children to express their opinions on important matters and decisions affecting themselves. From this perspective, even the youngest children have their own reasonable views and values and how they make sense of the world (Alderson, 2003). Whereas in the past, children were deemed unreliable or too immature to contribute to certain research processes, this approach assumes "that each child is capable of providing valid and insightful information, provided that s/he is approached appropriately and that the data are interpreted carefully" (Olafsson et al., 2013, p. 73). Taking this a step further, it was important to me not only to see this process in terms of what I hoped children could contribute to research, but equally what research could contribute back to them. This dual perspective is highlighted by Hill who argues that research seeking to understand the perspectives of children should not only avoid stress or distress and ensure that children make informed choices, but also that it should contribute directly or indirectly to their well-being (2005). A related view is offered by Alderson (2003) when referring to the "rights model" of ethics. In this model, research aiming to appreciate children's experiences should be guided by three Ps: provision, protection and participation. Provision refers to "the right to be properly researched"; protection guarantees that methods should be designed to avoid harm and distress and participation is concerned with children being well informed and having their views listened to. In this model the emphasis is placed not only on children making informed decisions about taking part and withdrawing, but also about the limits of confidentiality and the nature of their contribution.

However, children were not the only participants in my study and it is important to emphasize that some of the issues I explored in relation to them – particularly in terms of their rights and what they got out of the research - were equally valid with parents and teachers. With all participants I strove to make the relationship comfortable and to be clear that I saw the process as one of mutual engagement in order to place trust and respect at the core of our interactions.

In the rest of this section I will outline the key ethical issues I interrogated: consent, relationships with participants, harm or distress and privacy.

To begin, an obvious area of ethical concern relates to ensuring that the people participating are doing so on a well-informed and consensual basis. There were two issues here for me: first, how to present the research in ways that were accessible for the various participants and second, the role of 'gatekeepers' in the process. I will address this first in relation to the children and then in relation to the adults in my study.

Informed consent

In order to be valid, consent needs to be appropriately informed. The BERA guidelines make clear that this means participants should understand both the purpose of the study and the research process involved. Informed consent means that making sure that participants understand why their participation is necessary, how it will be used and how and to whom it will be reported (2011). With young children special consideration needs to be given to the way in which informed consent is explained and acquired. Hill argues that the language used between adults and younger children needs to be adapted to the linguistic understandings of the latter, and needs to incorporate checks and repetition (2005). Alderson suggests that it is a good idea, for younger children, to produce simple clear leaflets with simple language, diagrams and pictures. She suggests using colour and presenting this as a folded A5 booklet rather than a sheet of A4. She also recommends trying out draft leaflets with children first and seeking their critical views. This leaflet can be used as reference each time the researcher visits to ensure an on-going commitment to ethical procedure and to provide ample opportunity to revisit what it means (2003), ensuring that consent

is not seen as a 'one-off' event (Hill, 2005). Some researchers refer to the concept of *process assent*, which means being constantly mindful of how children respond to the research situation and altering course accordingly. In all of this process, another consideration is that it is important to find a balance between "fully informing" the child and overloading them with information so they become confused or bored (Gallagher, Haywood, Jones, & Milne, 2010). One suggestion is that more than one visit should be made to participants, the first being simply to gain consent and explain the research process. This allows for questions from either the child or the parent and leaves time for reflection before making a decision (Alderson & Morrow, 2004). I tried where possible to do this.

Inevitably tied up in this process was the issue of gatekeepers. The approach I took was to use the school as the initial route to access and consent. This occurred at two levels: individual and class participation. Initially parents were asked to make a decision about whether to specifically take part in the study; once a child had agreed I then also checked with all parents in that class, whether they had objections to me filming general classroom practice which might involve their child as they interacted with my focus children. With respect to individual participation I considered the issue of what parental consent means in a context that focuses on the child as social actor. I was concerned that parental acceptance of my invitation should not be used in lieu of the informed consent of the child and tried to find ways of making it alright for children to say they don't want to do something without feeling they are letting me/their parents down (Gallagher et al., 2010). In a contemporary study, it was found that one family put pressure on their child to participate, although she seemed reluctant. In that instance they continued and she enjoyed the experience once she had overcome her shyness (Chaudron, 2015). However, the author highlights that if it is possible to have an initial visit for familiarisation, this can give children more chance to get accustomed to the idea before committing to the process. Once certain children were participating and I started to spend time in the classroom, I was also attentive to the fact that children might be persuaded to take part against their will by the school context. Kellett and Ding caution that in the primary school setting "there are inherent dangers that participation could verge on coercion if children interpret it as schoolwork"

(2004, p. 170). In fact, no parents disagreed with me observing in the classroom and the children themselves were pro-actively engaged. I still took care to revise on every visit to any children in the vicinity of my recording devices, the purpose of my study and what would happen to the data. One thing that was unanticipated was that in some cases I recorded conversations between children discussing what I was doing in the classroom. These provide an interesting insight into their understanding of the process and could shed light on ethical considerations in the future.

In terms of the parents and teachers it was also important that they fully understood the purpose, extent and possible future uses of my research. With parents, I approached this by including several stages before speaking to the children themselves. They received an initial letter through school outlining the project. If they contacted me, I then followed up with a more specific email. On my initial visit we talked through the process and the consent form, and on subsequent visits I reiterated the principle that the child's interests were at the heart of the study. None chose to withdraw for this reason, although one child eventually was not interviewed as a result partly of logistical difficulties, and I think partly because the family lost interest. With teachers the process was slightly messier dependent upon how the school had delegated responsibility for the project. In one school, a specific Year 2 teacher showed an active interest from the start and took ownership of the project in school. In the remaining schools it was the head-teacher who was keen to participate, and I was sensitive to the fact that the motivation for this was different in each case – in one instance, the school saw itself as a beacon of good practice, in another, the school was aware of its shortcomings and some of the teachers were clearly not confident in their use of computers in the classroom. Ethically, it did not seem right to me that teachers in either school should feel they were being judged and I was keen in my initial meetings with the teachers to emphasise that this was a study of the children and that I was interested in the classroom context (and how it embodied wider school practices) more rather than their teaching practices per se. What was interesting about the process was that whilst all the teachers agreed to participate, and made their classrooms freely available for the study, it became increasingly apparent over the course of my observations, that teachers from two of the schools were genuinely interested in

the project and two of them were doing it because they had been told to. Effectively, they tacitly negotiated their consent by doing the bare minimum. This provided more reflection for me about the ethics of this kind of research.

Harm or distress

Having negotiated informed consent, the other most obvious ethical consideration needs to be that of harm and distress. In a study where I was going to be not only asking children to spend time with me perhaps at the end of a busy school day but asking about and observing their internet use, there was clearly the potential for stress, reluctance or even disturbing incidents to emerge. I needed to be clear that I had strategies for how I would manage these encounters to ensure minimal disruption to their lives, and a positive experience.

As a starting point, I had tried to factor this consideration into my design by allowing for several rounds of data collection. In this way I hoped to avoid rushing things or cramming too much into a visit (Stephen et al., 2008). In addition, in terms of our offline encounters, as I have outlined in the previous section, all of the methods I tried out with the children had been designed to be quick, fun and age appropriate. Before each method I briefly explained what we would do, checked the child was happy and as a back up offered them a laminated 'Stop' card with a visual icon, which they could show if they had had enough. I always offered the child the option to be either with or without their parent. Most of the children chose to have their parent present, and when they did I asked the parent to let me know if they felt their child was getting tired. When the child chose to show me something on their own, I asked the parent to check in at regular intervals to make sure they were happy the child was still OK. In addition I was mindful of the need to monitor the process for stress and tiredness levels. In fact, the children never asked to stop – either verbally or using the card - but on two or three occasions I felt intuitively that they was getting fidgety or disengaged and paused something half-way through to check or change tack.

When it came to online use there were some more specific issues I needed to consider. Whilst it would obviously have been inappropriate for me to introduce

children to inappropriate things they would otherwise not come across in terms of content, conduct or contact (Byron, 2008) I felt the choice of online tour mitigated against this, as the children would be asked specifically to show me what they liked and what they could already do. Nonetheless it remained a possibility that in the process of doing this a child might either disclose the use of an inappropriate site or inadvertently come across inappropriate web activity or material. The physical presence or close proximity of their parents (or teaching staff) mitigated against this possibility, but as part of my research focus was about ascertaining the ways in which parents and teachers frame internet use, I expected to find variance in terms of the levels of technical filtering in place, the levels of e-safety information children have been given and the monitoring strategies of parents. The issue of how I might respond to anything was therefore a delicate balancing act. My thinking was informed by the extensive e-safety literature, which suggests that for children of this age, the kinds of risk I was most likely to encounter would be either commercial or low-level issues of conduct. These are of a different order to the more high-profile risks often associated with the internet such as cyber-bullying or access to inappropriate content. The latter, should I come across them, were clearly things that would need reporting and would end any session I was involved in; the former were arguably incidences that would bear documenting, talking about and analysing. The advice from the leading experts on e-safety in the UK suggests that exposure to low-level risk and follow up conversations about how to deal with it are far more likely to develop children's resilience than avoiding the risk altogether (Livingstone & Haddon, 2009). My strategy therefore, was that, prior to any "show and tell" I would have a conversation with the appropriate adult where I would explain that, should such an issue arise, if they were present I would prefer to see how they respond. If they were uncomfortable with this, I thought it appropriate that I have a conversation about developing resilience to online risk with them and include this as part of my data collection. This did not prove to be the case. If I were the only adult present with a child/children when something happened I would follow the same procedure I would with my own 7 year old daughter, initially responding with a lightness of touch by navigating away and then mentioning in a matter of fact way that very occasionally we might come across things we don't like (just as we might in the offline world). I would obviously also gauge the level of distress caused before

continuing. However, research suggests that much online risk is not accompanied by harm, so I did not want to make the automatic assumption that such an incident would be harmful to a child, as making too big an issue of it could potentially make it worse. Before the end of the session I would invite the parent/teacher to join us for a discussion about the existence of undesirable material and appropriate levels of response should this happen again (i.e. how to report content). In practice, this was not necessary.

On a more general level, I was ethically uncomfortable with the idea that I should spend time with families or teachers without ultimately leaving them in a better position to navigate e-safety issues. As I have mentioned earlier therefore, part of the agreement with all participants was that I would deliver training or advice at the end of the project.

Privacy

The final major consideration in terms of ethics concerned the related issues of confidentiality, anonymity and data protection. In this I began by following some standard procedures, but also had cause to reflect on changing contexts and the wider implications of research engagement with the online world.

In accordance with BERA guidelines and the Ethics Policy of the Graduate School of Education, I began with the intention of ensuring that all participants be offered the right to anonymity and non-identifiability, I understood that if I should collect data on identifiable individuals then they must be given in writing the following data protection notice in a font that is not too small:

> "Data Protection Notice - The information you provide will be used for research purposes and your personal data will be processed in accordance with current data protection legislation and the University's notification lodged at the Information Commissioner's Office. Your personal data will be treated in the strictest confidence and will not be disclosed to any unauthorised third parties.The results of the research will be published in anonymised form."

The data I gathered was anonymised using a pseudonym system (where children were offered the chance to choose their own names as a way of helping them what is meant by anonymising their data). All audio recordings, transcripts, video footage were stored under these anonymous file names so that participants were not traceable. I recognised that participants should be guaranteed confidentiality in terms of what is done with the data collected about them. At the same time I was aware that both the University of Exeter and my funding body, the ESRC, support the RCUK position that "publicly funded research is a public good that should be made openly available to the public when legally, commercially and ethically appropriate" (University of Exeter Open Access Research and Research Data Management Policy). All participants were made aware that the data collected about them could be used to compile reports for both academic and non-academic audiences. I also indicated the possibility that in anonymised form, the data may be made available to other researchers in the field in order to produce more comprehensive analyses. I gave participants the option to opt-out of this use of their data.

In the school context, there was also the more specific confidentiality issue of ensuring that I did not pass data from one setting to another. Although ultimately I hope to use my findings to inform resources and/or pedagogy for improving online practices across contexts, I understood that my findings could only be used in a general way and that no specific data about pupils in their home context should be shared with teachers.

Finally, one issue that I did not initially quite anticipate was that of cloud storage and digital footprints. It could be argued that in any research now, where data is saved on One Drive or other comparable cloud storage systems, there is an issue about data protection (although many would argue data is more secure in the cloud than on a hard drive). More specifically however, when I began my study I was interested in the affordances of an app called Explain Everything. I thought this offered the potential to curate data with my participants, including photos of their homes and extracts of their interviews, in an engaging way on a tablet. However, I became increasingly conscious over the course of my study, of the changing status of privacy settings, the persistence (or difficulty of

deleting) online information and the potential irresponsibility of creating a digital footprint for children without discussing what this meant. In the "Changing Childhoods" project, where Prezi is used as a curation tool with the children, this is a deliberate engagement with a commercially available tool and involved discussion of the issues (Berriman, 2014). As my data collection progressed it became increasingly clear that PowerPoint was something that was very present in the lives of children this age. As using PowerPoint did not involve the same ethical issues as Explain Everything, I opted for this.

In conclusion, ethical considerations suffused my thinking throughout the process. In particular, they resulted in an increasing recognition of the many and sometimes intangible ways in which engagement with the research process might have an effect on all those participating. Simply by posing the question, to some extent I was encouraging reflection on the issue.

Integrity and limitations

Whereas quantitative research has derived mostly external measures for guaranteeing "reliability" and "validity", qualitative research tends to focus more on internal strategies for achieving "trustworthiness" or "integrity". Mason, for example, distinguishes qualitative research as aspiring to be "thorough, careful, honest and accurate (as distinct from true or correct)" (2002, p. 188). Seale argues for a form of 'reflexive methodological accounting' to achieve and demonstrate quality and rigour in qualitative research (1999). As a foundation for achieving this I kept a reflective journal during the process of my study, on which I have drawn throughout this chapter. As I have shown, there were many ways in which my research design had to adapt to the circumstances, a number of things I tried that I did not feel were a coherent part of the process or did not turn out as expected and some inconsistencies between form and content. In presenting the process in an open way, that acknowledges the difficulties whilst explaining the steps I took to rationalise them, I have nonetheless striven to justify its integrity.

Overall I would argue that the two main limitations of this study are firstly its messiness, which I see as a result of its over-ambition and the slipperiness of what I was looking at, and secondly the tension between being exploratory and

emancipatory. From the start of my study it was always very important that the knowledge constructed through the process should be 'useful' not only in the context of academia but more generally to teachers, parents and children. I hoped ultimately to empower people to adopt a more reflective stance towards online use. However, I saw this being something that would happen in the future when I had 'found stuff out'. In retrospect I think it was flawed to be thinking about whom research might ultimately 'speak to'. In doing so, I overlooked the fact that my research was speaking to people from the moment I started contacting schools. All of my adult participants were people who were alert to the uncertainty surrounding the issues I was exploring. They too were keen to explore and look for answers to the questions I was asking. Indeed, they were already asking them, which is probably why they responded to me. From the start there was a sense that the conversations we had were part of a general movement towards coming up with answers together. For some of these people, participation in the project was a timely instinct – some had had issues that were fresh in their mind. I am conscious that this tension between an emancipatory and a interpretivist framework is an unresolved issue underlying my work. I will return in the Conclusion with some ideas about how I would conduct research in this area differently in the future.

Chapter Three: Findings

The aim of this study was to reconceptualise the ways in which parents and teachers might support young children to have reflective relationships around online device use.

OVERALL RQ: How might parents and teachers support young children in having reflective engagement around online device?

In order to address this overarching aim I devised three main research questions:

RQ1: What characterises children's online practices across home and school?

RQ2: How do different aspects of their contexts shape their perceptions and practices?

RQ3: What characterises their emergent understandings of and reflection on online engagement?

Using the available literature at the time I derived a conceptual model, which gave me a framework for exploring these questions. However the founding belief of the study was the need to be attentive to the actual messy realities of children's lives and to adapt in response to what emerged. In this chapter I will attempt to bring to life my case study children's lived experience of using connected devices using portraits that are both descriptive and thematic. As far as possible I will present my findings using illustrative episodes, in order to represent children and their families in their own words and practices. These portraits will highlight some of the micro-differences between relatively similar children living close to each other in how children develop an understanding of and attitude towards online devices. The participants in the study were drawn from two different primary schools in the city. One of these was 'feeling its way' with technology, whilst the other had been more pro-active about being up to

date. I will preface the portraits of children in each school by giving descriptive overviews of their children's classroom contexts.

School 1

This school is a larger than average primary in the heart of the city. The majority of children are of White British heritage and the number supported by the Pupil Premium is roughly half the national average. In the course of my study, this school was inspected by Ofsted and was graded 'Outstanding'. In terms of how technology was being used in the school however, the Headteacher herself admitted from my first visit that there was room for improvement. The first barrier was the lack of consistency in hardware across the school. Each classroom has two or three desktops, there is a school set of laptops, all the children in Years 5 and 6 have their own RT tablet and there are a few iPads "floating about". The RT tablets were bought on the advice of a secondary IT coordinator, but the Headteacher feels they were a mistake as they cannot go on a network, children change things and monitoring "is a nightmare". When I first arrived at the school the Head was considering options for buying new computers and had earmarked some money from the school budget, only to find out that she needed to spend £60,000 on a new sports field. She was therefore unsure whether any money for IT would be available. The second barrier was management of the various devices and systems. The school use an external IT company for technical support and had recently asked them to audit the school equipment and make recommendations. One current problem was the logistics of clearing all of Year 6 tablets to make them ready for use for new intake. This was going to take a long time, time that could be better spent by the outside technician who only came in one day a week. The third barrier was staff time and confidence, with the Head stating that there was "literally no-one on the staff prepared to take on the role of ICT coordinator". On the one hand this was because they were already having to get up to speed with many other new things that had come in over the past year – on-going pupil data tracking, assessments without levels, new testing at KS1 and so on. On the other hand, there was a sense of nervousness (Year 3 teacher talked of it being 'daunting', Year 1 teacher said she was glad she didn't have to do it with the older children) of having the responsibility for teaching children how to go online

and time pressures meant that no-one could commit to developing their skills in this area.

At this point therefore there had been no attempt to start implementing the new National Curriculum for Computing. The teachers were open that they did not feel equipped to deliver it, and it was primarily the Head herself who was managing what was done in school. She had adopted the SWGfL 360 degree Safe self-evaluation programme and recently attended CEOP training. Following this there was a staff inset day to provide materials and her expectation was that these were now being used. However, the teachers said they had been overwhelmed by the training day and did not feel they had the time to go through the resources and work out how to use them in practice. They expressed a desire for more specific, hands-on CPD to help them with it.

Some of the parents have expertise, which could be helpful to the school. One mum has offered to run an after-school Scratch club and also to look at the school's Acceptable Use Policy drafts. There is also a parent who is head of IT at another school. The problem with capitalising on what these parents might have to offer is in knowing where to start. The Head sees this as big issue, and is struggling to see where to begin.

Six of my case study children were at this school. Between February and June 2015 I visited the Year 2 classroom eight times, on each occasion spending between one and two hours. I recorded video and audio material, took photos and made field notes.

In this classroom there are two desktop computers placed along one side of the wall. Each is at least five years old. The class also has access to three netbooks, which are situated in a corridor outside the classroom on a charging trolley. On the walls by the computers the teachers had introduced posters about e-safety and reminders for logging on.

On my first visit to the school, it was apparent that one of the computers was not working at all and the other had a mouse that was working only intermittently. The children and I tried to mend it and eventually the

Headteacher, who was walking around school, stated that there were problems and got down on her hands and knees to fix both of them. The children observed that the computers were always a bit like this. On my next visit, the teacher began the afternoon session by saying that she could not log on to her computer to do the register and told me there had been arguments over the computers that morning, partly because one of the desktops was not working. Over the course of my visits, my field notes repeatedly observe things not working:

> Look two of the buttons have fallen off

> Another girl is standing up saying 'But it isn't loading'. On screen I see the message 'Starting repair' and I hear the girl say 'I need it for my learning'. I notice this message is also on the screen of another netbook.

> A girl comes and says she needs to do a PowerPoint. Some other girls tell her to use the other one "cos it's broken"

> Two of the netbooks are not working – someone goes to get some others

> Extracts from field notes from various visits April- June 2015

In each class two children have been appointed 'computer monitors'. They are responsible for fetching netbooks from the corridor, checking they are charged and plugging them in if not, and sorting out any minor technical issues. The four children chosen here were obviously children who brought "funds of knowledge" (Moll, Amanti, Neff, & Gonzalez, 1992) from home, one of them was the son of a former IT teacher, another had a father who worked in IT. Over the course of my visits my field notes observe on several occasions that they spend a lot of class time 'trouble-shooting'. For example, one child tells me as soon as I arrive that they have to use keyboard shortcuts for certain functions because of missing keys. On another occasion I hear a computer monitor say" I've just been rushing around doing all of this" in reference to sorting out functional problems. This is done without any reference to the teacher or teaching assistants. One day one of my participants, Lottie, is unable to log on to the school network and, not recognising the problem as a typo, assumes it is something wrong with the computer (a reasonable assumption given the

computers are old). Her first 'solution' to the problem is to bash the keys repeatedly. After this she spends almost the entire lesson going to and fro fetching different laptops, trying different user names. It seems there is a mentality amongst the children of working round problems with the computers

The school encourages independent learning through a 'quest-based' approach to the curriculum. Each half term the children are introduced to a new topic (the ones I observed were 'Roald Dahl' and 'How does our environment make us feel') and are invited to come up with their own questions and decide for themselves how they would like to present their learning. Each day they are allowed to choose their own activities to help them answer these questions, making use of any resources available in the classroom – computers, books, craft, the outdoor space. They are given the responsibility of using their time for learning. Within their array of learning options, the computers are available for research purposes. Access to computers (and online world) was therefore in theory freely available and each day it was up to individual children whether they wanted to use them.

There are two Year 2 classes one of which has two part-time teachers. Of the three, one is quite confident with computers. Previously she taught Year 5, where she had done some blogging. The other two tell me they feel less confident and more wary of the benefits of technology. One of them tells me she is not allowing such free access to the computers anymore because the children "were getting too focused on computers to the detriment of other activities". It got to the point where there would be loads of children crowding around one computer just so they could see the screen. She does not think this is healthy. She also says that she does not think that using the internet is a particularly appropriate activity for this age group. She asks why there are no specific search engines for children and then laughs and says "perhaps that's what I should do – design one of them". However, she also tells me on another occasion that in terms of using Google to do their independent research they have been given no specific guidance, because "they how to do this anyway". One afternoon when I arrive in the classroom, she is announcing that there are four children who are not allowed to go on the computers again until they have 'earned' it. She has made lanyards and from now on children will only be

allowed to be on the computers when they are wearing them. She asks the rest of the class "If you see these boys on the computer and they are not wearing a lanyard can you tell me or another adult" and to the boys in question she says: "You might think it's mean but actually I'm helping you because I think the computers are taking over your learning".

Nonetheless, all three of them are keen to reflect on how they could make better use of computers and try things out that might encourage the children to be doing things independently. Over the course of my visits I was aware that they were adapting as a result of what seemed to emerge. On my first visit one child had spent an entire lesson looking for a document she had saved but could not find. By my final visit, the teacher had spoken to the children about where and how to save work and the children were able to find things much more efficiently.

In terms of any modelling, the teachers rarely used online sources on the whiteboard. I saw one of them use Google Images once to find a picture of some dandelion seeds, and sometimes they would use a Classroom Management App – onlinestopwatch.com – which would display a countdown whilst they tidied up.

I generally visited in the afternoon to have most chance of observing the children using computers. On these occasions I noted that there was always a sense of movement in this class: it was loud, there were lots of activities and there was encouragement to work things out together, without adults. I often saw children wandering, sometimes with netbooks in hand, asking others for help, or crowding around looking at one computer. In terms of the sites or platforms children were using, it was invariably either PowerPoint or Google. What I mostly saw were children looking for things from previous sessions, making design changes to things from previous sessions, trying to work round things that were not functioning, showing each other things and scrolling through images. From my first visits I was aware that observing practices was not going to be as I had anticipated.

Building on the aspects of context that might shape children's reflective engagement in this classroom, several things emerged as potentially interesting. First, at the material level, it was clear that logistics played a major part in how devices were embedded and that these potentially weighed heavily against some of the value-driven and policy inforned decisions the Head was keen to make. In addition, the lack of teacher confidence with anything specifically framed as 'IT" suggested that scaffolding of reflective engagement was unlikely to be consciously modelled and I did not expect to see 'active mediation in the strict sense. In spite of this the strong pedagogical focus on independent and peer-to-peer learning meant there was chance that social factors would play a part in how practices and perceptions were shaped.

The six specific children I followed from this school experienced the classroom in quite different ways. Using individual portraits I will illustrate this by first choosing an episode from school and then moving to look at their home context. In so doing I will try and highlight how their practices and perceptions seemed to be shaped by different aspects of these contexts and the extent to which any reflective engagement (in any dimension) around devices was happening.

Joe

School portrait

Unlike some of the other more technically confident children in his class (like the computer monitors mentioned previously) Joe appeared to find the frequent equipment problems in his classroom a barrier to engagement. As a result he rarely made use of computers or netbooks across the time I was there. I spoke to him on three occasions whilst I was visiting. On two of these he was making paper books. On the third he had been allowed to use the teacher's laptop because the netbook he had been using had crashed. Even this machine was fragile: "Just be careful with this. It's broken but it's taped on"
First of all he types his own name, then he looks at font colours, then he plays with the text box. Someone asks him if he wants to change his background but he says no.

He seems to enjoy just making the text box appear and disappear, and playing with making shapes out of the shaded text box. Various children ask him if he wants help but he says "no thank you I don't need help" So far all he has written is "Roald [Dahl] by [his name]" Someone tells him he needs to start a new page so he says "Alright. How do I print this one?"

He doesn't know how to do a new page, so another child comes and helps him

He clicks on an icon and opens a picture library.

"Oh dear what have I done?" [raises voice]

He now copies the wording "Clik [sic] to add title" and writes his name underneath

Then he deletes everything and plays with the cursor

Starts typing "clik" again

Teacher comes and says sorry but she needs to use the laptop now to project a timer on the board for tidying up. She asks if he knows how to save his work. He doesn't so another child comes and helps – names it "Roald by [name]"

Lesson ends

Extract from field notes, June 13th, 2015

Joe's classroom practice could be characterised as immersive visual play. For the brief window he gets to use the computer the visibility of the screen and the fact he is using the teacher's laptop means he becomes the focus of attention from other children. They are keen to help but he prefers to be left alone. He is arguably working 'under the radar', not doing any kind of 'proper' activity or using PowerPoint in the generally accepted way. This freedom to explore was the result of a more general pedagogy of independent learning fostered in this classroom. However, when he encounters problems, he waits for others to help him resolve them. His understanding and reflection appear at this stage to be functional and developing in relation with the screen rather than in any interactions around it.

Family portrait

Joe's family live in a three bedroom terraced house close to the school. Mum works in an administrative role and uses computers (but not really the internet) every day; Dad works for DEFRA, also in a fairly administrative role, using mapping systems and government IT systems.

In terms of their attitude to technology, the "last thing" dad wants to do when he gets home is go on a computer, but mum is a bit more pragmatic, using the internet to organise birthday presents and do weekly shopping for example. They are on Facebook, but do not use it much, really just to see photos of friends in Australia. Dad tells me he "never comment[s]" and mum says "if I'm sat there on it I'm thinking there's other stuff around the house I should be doing". Mum has a smartphone, but with "no games". Dad does not and describes himself as very much "old school".

> Dad: I see a lot of people doing that at swimming lessons, parents just staring at phones. Maybe that's just me …

This implied disapproval of over-reliance on devices suggests Joe's parents are aware of the potential ways in which modelling engagement with devices might shape the boys' expectations. However, at another point he acknowledges he too has been guilty of this.

> Dad: They've got encyclopaedias upstairs, but even though I like books my first response is just Google it. It's just the way it is cos it's going to be there instantly isn't it? It would be better for him probably if you went upstairs [to look at books] to try and find out

Mum in particular is very aware that her values may not align with those of her children, but she is conscious about not letting her own values hold her children back:

> Mum: I don't want to leave them behind because I'm not interested in technology and the internet. So I think just because I'm not I can't ignore them and what they've got to do to sort of help them in their education and their future

In terms of daily life, Joe likes to play with Lego, action figures and train sets. He builds Lego according to instructions with mum or dad but then prefers breaking it up and making his own thing. He loves role-play and can play on his own "for hours", acting out bits from films or building his own worlds, often based on popular media stories or games. Mum describes him as "happy in his own world". Outside the house he also does regular swimming, Beavers, and

playing out in the road with friends. He has an older brother who he sometimes plays with and sometimes ignores.

Watching Joe use devices at home is an interesting comparison with school. When I set up he is very intrigued by the iPad camera function and has two or three goes at filming his cuddly penguins. Each time he experiments with bringing things in and out of focus. He puts a cushion in front of the lens enjoying exploring how the texture gets magnified. Mum tells me he also takes photos on her phone:

> Mum: It's quite interesting when I go back and look at them and they've been taking pictures of their bears and stuff
> Dad: 45 minutes of car driving, all very existential

As at school, Joe appears to be interested in visual play with the textures and shapes on the screen.

The main thing Joe wants to show me though is how he plays *Minecraft*. For him, *Minecraft* appears to be experienced as complete immersion in exploring an imaginary world. It is a physical experience. He always plays *Minecraft* standing up:

> Mum: "He's like this [demonstrates]. It's hilarious"

Whilst I observe he is jiggling about and moving the whole time. He is also very aware of the sound/attentive aurally:

> Joe: I walk around and … I can hear something. What's that noise?
> Joe: I can hear baddies
> Mum: Baddies? How do you know? What's the sound?
> [Soft piano music has started up in the background now]
> Joe: I can hear 'urgh' [groaning sound] and kind of spiders creeping
>
> Joe: I'm going somewhere [voice rising]... I'm going somewhere … [throwing down a pile of blocks]
> Me: What are you doing?
> Joe: I'm pressing 'B' because somewhere is a bad thing … it's really dangerous. I'm just going to see if it's still there

Me: Why are you throwing bricks at it?

Joe: Er … er … so I don't die

Mum: [Under breath] He doesn't really know, like, the idea … you know, what you're supposed to do

[Brother comes in]

Joe: Right let's just leave this [walks away from pile of bricks] Through here's a dangerous place

Brother: It's called 'the Nether'

Joe: Ah …. Ah … I'm leaving here … Oh my God [shouting] there's something burning in there [goes out]

[Brother joins game]

Joe: [Jumping up and down] Oh … Oh … I can't move. I can't move

Brother: [Calmly] Just press [shows him]

Mum: [under breath] When he comes off he'll be really red-faced and then we'll have tears … 'I don't want to come off it, I don't' want to come off it'

This episode highlights several interesting things about his engagement with devices is shaped and experienced, for example in terms of his sibling relationship, his difficulty detaching from the game and his mum's perception of there being a 'proper' way to play, to which I will return.

Joe's online practices at home and at school

From my observations and what Joe and his family tell me, his practices can be exclusively characterised as 'playing' or watching. There is clear crossover between what he does on devices and his other play, both in terms of transmedia play, where narrative and characters appear across platforms (Herr-Stephenson, Alper, & Reilly, 2013), and in terms of the creation of 'worlds'. When I arrive he has lined up his cardboard *Minecraft* models to show me and then swiftly moves on to suggesting he shows me how he plays on the Xbox.

In terms of online activity he primarily visits YouTube with his brother to look up video clips related to their favoured imaginary worlds:

Mum: That's all they ever really watch is *Minecraft* clips or *Toy Story*

In addition he also watches amateur footage of trains, which again mum links to his bedroom play with train sets, and Lego "unboxing" videos (Marsh, 2016)

> Mum: He puts in Lego and then looks at all the different boxes of Lego … It used to be the Argos catalogue you'd flick through, now it's this

Both at home and at school, a prevalent mode in Joe's practice is visual, whether that is watching, playing with visual features or exploring a virtual world and whichever of these he is doing he appears to become completely immersed in the on-screen activity.

> Joe: Right let's just leave this [walks away from pile of bricks] Through here's a dangerous place
> Brother: It's called 'the Nether'
> Joe: Ah …. Ah … I'm leaving here … Oh my God [shouting] there's something burning in there [goes out]

His response to a wrong turn in *Minecraft* is experienced in a not dissimilar way to when he makes a wrong click in PowerPoint:

> He clicks on an icon and opens a picture library.
> Joe: Oh dear what have I done? [raises voice]

Joe's immersive visual play appears to be driven by curiosity and imagination and experienced through a range of emotions. However, his mum thinks that at times this is too much for him:

> Mum: [under breath] When he comes off he'll be really red-faced and then we'll have tears … 'I don't want to come off it, I don't' want to come off it'

Aspects of context

In terms of how aspects of Joe's home context might shape his engagement, **materially** the main focus in this family appears to be on creating safe, managed spaces. This happens at various levels: device, network, usage rules and content.

On my first visit, the Xbox is in the corner of the sitting room. In order to show me how Joe plays, mum gets down on her hands and knees and scrabbles around to get it set up, suggesting that Joe himself does not just go and use it independently, he needs the space to be provided for him. Something appears to be wrong on the screen:

> Joe: Oh no
> Mum: This is where I get stuck …
> [She fiddles about for a couple of minutes and gets it sorted]

In terms of general access, as well as the Xbox, there is a TV in the sitting room and next door in the dining room there is a laptop, which is stored on a shelf. The children have to ask to use the latter and then do so in this shared space:

> Mum: Then we know, well we're 99% sure, I know what he's going to go on and
> use, or watch rather …

The boys' use is also regulated through parental controls set through their ISP and mum uses restrictive strategies to control time spent on devices. Joe however, appears unclear about the latter:

> Me: Are you allowed to go on as long as you want?
> Joe: Er …yes
> Mum: No … They can have half an hour each but what will often happen is Joe will be
> watching and [brother] will drift in and they'll sit and watch together

Although mum sets these rules there is some flexibility about them:

> Mum: I set a timer – the kitchen timer – for half an hour but if I come in and see
> there's seven minutes left of that film playing I'd say 'yeh yeh you can watch to
> the end of it' … This morning half an hour magically turned into an hour. It was
> like 'weren't you supposed to be off at ten?'

The rules are also evolving in response to mum's observations of their use:

> Mum: Every day they ask to go on [but] in the last couple of weeks we've turned
> a corner and said 'you're not allowed on it [at certain times] cos we can't have
> you coming off in tears … it's just a game'

As was apparent in the *Minecraft* episode quoted earlier, mum sees Joe as not really playing the game in the 'proper' way, whispering to me as he plays that "he doesn't really know, like, the idea … you know, what you're supposed to do". Later she repeats this view:

> Joe: Quick get into bed before the baddies … Can we swap again?
> Joe: How do I break stuff? [getting upset] It isn't working. Ah … no don't kill me!
> Joe: Let's go. Shall we go? Come on [brother] let's go out
> Mum: He's obviously enjoying it at a different level [to his brother]. He can actually <u>do</u> stuff

Mum assumes there is a right way of playing *Minecraft* that Joe is not getting yet, but she is unsure what this is. Nonetheless she is trying to understand:

> Mum: We've said to him 'don't you want to do creative [mode]?' Cos this is survival isn't it? [checking with me] But he says survival is more fun

On the laptop Joe's parents also pre-select some of the content that is available. They have researched and initiated the use of educational activities such as online comprehension tests and maths games for example. Recognising the boys' interest in Lego and the unboxing videos, mum subscribed them to the official Lego club. However, as we have seen, the boys generally just gravitate towards YouTube. As a result mum and dad recognise the need to start thinking about the implications of being in less controlled spaces:

> Mum: Then I realised … it seemed to be on YouTube you're only six steps away
> from sort of when you've watched something then you watch something else
> and then in six steps inappropriate stuff's coming up.

The decisions Joe's parents have taken about purchasing and managing device use are in part informed by their wider values. However it could be argued that the material environment of this household is shaped equally by the boys and their peers, through their requests and what they take for granted as normal. This is bringing practices and value systems that are unfamiliar to their parents. The Xbox was a birthday present for the boys and this introduction of a new

device into the house was thought through and cautious. It was not a decision they took lightly:

> Dad: We've resisted as long as possible
> Mum: Yeh we have resisted

The reason they bought it was because they felt it had got to a point where they needed to keep up with what the children's friends were doing:

> Mum: They've never nagged 'can we have an Xbox?' it was just one day he [older brother] used to go to his best friend's house and I know them really well and I'm happy with him playing there and one Friday he said 'can I go round cos they're going to be online?' so two houses were going to be online at the same time and I said 'no, it's Friday, everyone's tired, it's not the day' and he sort of slumped against me and I thought you're not nagging but I know you're feeling left out so we [mum and dad] had a chat and decided it was time

In terms of creating safe spaces, this has led to them also having to understand how to establish a managed network between neighbouring households, something they don't themselves feel equipped to deal with:

> Dad: This was the first time I've thought – obviously there's the YouTube thing – but this is the first time he's going into a kind of live internet thing. How safe is that? I don't really use it that much myself. I never used computer games so I don't really know how it works

In order to do create the managed space they wanted for the boys they had to seek advice from more knowledgeable friends:

> Mum: These friend's parents told us what we needed to do to get set up.
> Dad: They briefed us
> Mum: They did, they briefed us. You need this, this, this and this.
> Mum: So this £20 annual fee allows you to go online and say when you're going to be on – say at 4.30… without access beyond

This need for a wider social network of support to draw on is something they come back to several times as their preferred way of keeping up to speed with things:

Mum: That's why I go to the school and friends cos they're the best people to hone in on these areas cos there's so much on there and I find it overwhelming

This family's engagement with devices was therefore being both catalysed and supported by the wider network of peers and parents. Socially and emotionally however the major influence on Joe's engagement is his older brother. On the one hand, because although his parents have invested time and effort into researching and providing safe, managed spaces in which to play, these have more tailored to his brother. On the other because most of his shared experience is with him. His brother was the first person he said he would ever ask if he had a problem, and also the one most likely to upset him.

Joe's older brother is portrayed as being one step ahead of the rest of them:

Mum: Yeh they take my phone. I see them sat there trying to get in. They do know how to get in and [brother] will turn round and say 'oh look I can see our house' and I'll say 'how did you do that?'

Joe has access to the Xbox because his parents thought it was time for his older brother. Nonetheless, they are not wholly comfortable with their decision

Mum: We just think what have we done? What are we doing? He's too immature
Dad: I would probably have given it a couple more years

Mum's concern is that Joe being drawn into things his older brother does but perhaps without the ability to remain detached or control his emotions:

Mum: There was one complete meltdown and it took me a while to get to the bottom of it. Joe had come off … he'd finished his time, his allotted time, so [brother] still had it on split screen but he let him die or killed him and it took me a while to get to the bottom cos he was sobbing and I said 'well how did you die?' and I got out of him that [his brother] had killed him or just let him die. And I said to [his brother] 'did you have to let him die?' and he said 'no, but I just did cos he's not playing' and I had to point out how upset he was and say 'can you not do that again'. And it took a while. He was just sobbing for minutes

This kind of emotional support, helping Joe to manage his frustration and upset, is the only broad **pedagogical** strategy I observe in this household and I will return to this as a potential way in which reflective engagement could be further supported. 'Active' discussions of safety or general use, as described in the parental mediation literature, are largely absent. Mum tells me that they have only ever arisen in response to something that Joe's older brother has done at school an even then Joe was not involved in the conversation:

> Mum: … a very brief lesson I think it was, about people pretend to be your friend in your age, sort of stranger danger awareness online. I remember it now, it was about what information you give out. You don't give away where you live and your telephone number and everything about you

Emergent understanding and reflection

Whether at home or at school Joe appeared to operate mostly in his own worlds, which were effectively managed environments that had been provided by his teacher or parents. Once in these worlds, Joe became immersed in play, making little connection between them as imaginary "worlds" and anything beyond. Indeed, functionally and conceptually there was little evidence that Joe was engaging in any wider reflection about device use and its workings or its consequences.

What struck me being with Joe's family was that there was a lot of reflection going on, almost exclusively catalysed by Joe and his brother, but not necessarily actively involving them. Some of the issues Joe's parents identified as in need of reflection chimed with those I had identified in my literature review. In particular mum was keen that as a family they find balance, with one of her concerns being how overwhelming the Internet is:

> Mum: What's on offer is immense, trying to narrow it down … there's so much on there and I find it overwhelming
> Dad: But on the flip side you never actually learn anything cos you're just bombarded. I'd rather read a book than spend too long on the internet. I mean it's obviously got loads of stuff on it but you never actually … What I'm worried about is that they're never going to concentrate on anything for too long. You know they can never just sit and enjoy the world

They also identified trustworthiness as becoming more problematic. However, they still thought both children were too young for it to matter much to them yet:

> Dad: Wikipedia is normally the one that comes up first and everyone knows that's not 100% accurate cos it's written by lots of different people isn't it? I don't have a massive discussion with him [Joe's brother] about it I just say you know it's more what he might want to put in terms of content rather than whether it's true or not. But I guess the problem is you've got hundreds of different websites and they've all got slightly different information. I suppose when you're 9 [ie older brother] it's not going to matter a huge deal if it's slightly wrong you know

Rather than start talking to either of the boys "too early" about things they might not be capable of grasping they prefer to adopt more of a 'just in time' approach, staying just slightly ahead themselves in terms of understanding.

> Mum: I've kept it thinking if I have a problem I'll go to it [a sheet sent home from school] because at the moment it seems that what we've set up is OK … I know there's a place I can go

It could be argued that there were already opportune moments occurring in family life, such as the sibling fight or the change in rules, where small steps were being taken towards having a dialogue around emotional impact or the justification for boundaries. This raised interesting questions for me about whether support was more about helping people find more casual ways into discussion. Joe's mum told me she found one-off advice sessions too overwhelming and would prefer to get things in smaller 'chunks' suggesting that what might have been of use to her were ideas for conversation arising out of some of these ephemeral moments. In retrospect, these questions would have been good to follow up on and suggested methodological improvements to which I will return in my conclusion.

Ben and Luke (twins)

School portrait

Almost every time I am in the classroom Ben is on a computer. One time he is tweaking a quiz he has made about Roald Dahl. Another time he is making what he describes as a "Maths Challenge" using Microsoft Word. The main focus on both these occasions appears to be on systematically exploring various menu functions, seeing how he can change what the thing on screen looks like. With the quiz he actually does it once and then deletes it all and does the same again in a different format. With the Maths Challenge talks me through how he has done it:

> Ben: I made a chart by going into 'Insert' and then 'Chart' … You can change the colour cos when you click on that it comes up with 'Chart Tools' at the top and then [trying some new items on the menu] like 'Layout' you've got all that … and 'Format'

When I ask him how he knows how to do this he says:

> Ben: I just learnt it when I got onto the computer

In school, Ben has been given the role of 'computer monitor' as he is perceived as someone who is competent.

Ben's twin brother Luke is in the other Year 2 class, so although they see each other they are usually in separate rooms. In contrast to his brother, on most occasions that I see Luke in the classroom he is struggling to get access to a computer.

> Luke: I really need one of the computers
> Boy: Why?
> Luke: Because I never went on there to have a PowerPoint. That's why I really want one
> Boy: Luke do you want to do a PowerPoint with me?
> Luke: No I just want my own one

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Luke: *Please* can I have a go on a computer?

Luke: Please can I have one of your guy's computers? Anyone?

Luke: Tomorrow am I allowed to type in as me?

Luke: How do I make my new file? How will I make a new file?

Boy: Do it yourself

Luke: How do I make a new file please? Please can you tell me?

[Computer starts logging of]

Boy: I'll do it after assembly

On this occasion he gives up and I see him ask some boys if he can have the cast-offs from their printed out PowerPoint. He then proceeds to carefully colour around the edges and tells me he is going to turn this into a book cover.

Although in theory both boys have the same access to devices in the classroom, it seems that the way the environment is constructed means Ben is getting more opportunities and freedom to explore, develop mastery and be creative.

Family portrait

The twins' mum works in the school office; their dad used to work for a bank and is now commercial factoring manager. Mum describes dad as 'very techy'. He has always been computer savvy, he is the one who sets everything up and "does all the cables". In contrast, mum describes herself as feeling "quite un-computer literate being quite an old school older parent." The boys also have an older sister who is in Year 5 (age 10). She uses a tablet at school.

When they are not on devices the boys play Lego, watch TV, mess around in the bath and play occasional board games. There is Lego all over the place, including several *Minecraft* inspired pieces, along with piles of junk modelling. Twice a week they have organised after school activities, Beavers and football. On the other days they attend after school club. They are generally "quite outdoor kids", they like playing cricket and "if we're doing something as a family we tend to be out and about – at the beach, bike ride". When I visit, the boys' older sister is cooking with mum. At one point they stop to show me a photo of some *Minecraft* cupcakes they have made recently.

Ben and Luke's practices

In terms of what they are doing by themselves, mum describes tablets as "for them really a games device". Both boys devices are populated with a range of game apps, including *Minecraft*, many of which they have downloaded themselves from the Google Play Store. They have access to dad's Spotify account and both like to listen to music, although only Ben has created his own playlists.

> Ben: From the radio we've got in there sometimes I hear songs and then I like it
> and then I look up in there and then I put it onto my playlist

They also curate their own watching or wish lists, recording episodes of programmes like Lego *Ninjago*, accessing the internet to watch YouTube for what mum calls "Lego demos" (unboxing videos) and looking up songs and toys they would like to buy:

> Mum: They're very savvy at that [finding and recording]

In addition they use the tablets for reading books and dad has worked out how they can access the library's collection of e-books to do this.

When Ben shows me his tablet he has customised his home screen with photos he has taken. As he is doing so he decides to put on a new screensaver and starts scrolling through his photos. He chooses one of a Lego funfair his brother has made. There are three pages of icons of things he plays with, but he tells me his favourites are on the front page.

In terms of more communicative activities, although their big sister uses Skype to chat to her friends, the boys are not really interested in that. However, they do all play *Minecraft* together, where over a period of time they have been collaboratively constructing a shared world:

> Sister: Who made the waterfall? There was not a waterfall there before
> Ben: What waterfall?
> Sister: Outside the hotel

Ben: Let me look at it

Sister: I started building the hotel and then Ben came into my world and then I said do you want to help and he said yes so we kind of did it together and we kind of worked together from there

Sister: I found a really cool room Ben. Did you build this room? It's cool

Sometimes however, Luke prefers to take himself away and play on his own. Whilst I am there he puts his headphones on and sits separately from the others

Mum: It means it's not so noisy for you doesn't it? With all the burblings of here …

[Luke starts singing along to the music. Mum whispers to me] They're very different characters

The boys seem to see their tablets as both personalised entertainment devices and part of the fabric of family dynamics. At times, they are collaborating with each other and/or their sister, at times retreating to their own personal space. From what I observe, Luke seems to see tablet use as down time or relaxation. Whilst Ben does too, there are also signs in his practices of emergent curation and he is clearly motivated by exploration and mastery.

Aspects of context

Engagement in this family is first of all shaped at a **material** level by the fact that all three children have their own personal tablets.

Mum: Now they've got these, the ownership is theirs

Since they got them, the children are no longer interested in the "old-school" desktop computer upstairs in the spare bedroom. Although mum still uses it for shopping and banking, recently when the children have gone to bed mum even she has started using their tablets to check Facebook or upload a Sainsbury's order because it is easier.

Both parents have smartphones and very occasionally the boys use these; there are a couple of games on dad's phone and mum has found a few

"unintentional videos" on hers. There are no games consoles in the house as mum sees them as "complete time wasters". Effectively there is no need for the boys to use either of these as their tablets perform the same functions only better and more personalised.

When they get in from school mum usually tries to give them a drink and a snack but "if they see their tablets first they run to their tablets if they have charge in them and they just get straight on them and play". They are officially allowed an hour, but if dinner is taking longer to cook they get extra time. Mum sees this routine as being beneficial to all:

> Mum: It's nice to have that relaxation, down time, after school. They enjoy it.
> Dare I say it's easy parenting. You can get a couple of jobs done, start the tea.

The job of managing this time is partly done automatically as dad has installed an app on their tablets called *Screen Time*, which can be set to control their time limits. Ben tells me at one point "I've got 24 minutes left today."

As well as ownership of the tablets, this gives the impression also that the boys are taking some shared responsibility for managing their own use. Another way that time is shaped in this household is by having days off and this has been justified to the boys on health and behaviour grounds:

> Mum: We try and have two screen free days a week linked in to days when they
> have activities after school because we find often these become a bit addictive
> particularly if you're in *Minecraft* and they're in a virtual world, battling against
> each other. They kind of get quite oppositional and not aggressive, but leading
> up to it about being taken off it before having tea and rushing out to an activity

Although these are what the parental mediation literature would call restrictive strategies, there has clearly also been some discussion of the need for time rules. In addition mum also uses supervision. They mostly use their tablets in the main living room so mum "can have half an eye on what's going on." She is usually in the kitchen at that time, but with the radio on and the washing machine going she can be only "vaguely aware" of what they are doing. However, as her daughter is older and more reliable she tends not to worry:

> Mum: I know I shouldn't use a child as an adult monitor but when they're on *Minecraft* you know they're on *Minecraft*. You can hear the sounds

With three of them all having their own tablets, the potential is there for the environment to be quite noisy. Normally however they put headphones on so they don't disturb anyone else.

> Mum: When there were two different musics doing on at the same time that got a bit hard [laughs]

Sometimes they go upstairs and "if they've been gone for a while then I will go and nose at what they're doing." They are not always good at remembering to charge them up so mum sometimes finds them "at random power sockets around the house."

In this family there seems to be an ethos of giving the children a level of freedom and responsibility and encouraging independence. When rules are made, there is some discussion of why they are needed. However, mum tells me the line between 'policing' them (mum's word) and leaving them to it needs vigilance and sometimes the boundaries have to be redrawn. For example, she doesn't always know what games they have or what they see when they go to the Google Play Store and recently this has led to problems:

> Mum: I don't know what the filters are. But we had an incident the week before last and now everything is blocked and they have to come via us.

At after school club they had been sitting with some Year 6 children who are allowed to use their school tablets.

> Mum: Then I came in one day and you couldn't see Luke's bed for soft toys and I said 'what's going on here?' and he said 'I've created Toyland'

Mum asked why he needed them and found out he'd been having bad dreams because "they'd put this game on that was linked to Nightmare on Elm Street with Freddie" (*Five Nights At Freddie's*). Following this the boys had downloaded either a trial version or an advert on to their own tablets:

> Mum: So then [dad] and I had a big conversation and he went through one night and took off everything that he wasn't sure about and put the block back on because we'd got slack. We were watching them ever such a lot when we first had them and then we stopped. We got lazy … complacent

Although she accepted responsibility for taking her eye off the ball, the thing that concerned mum was the fact that they had been introduced to something inappropriate in school and on school property. Her daughter insisted the teachers would never allow it on school tablets, but mum replied that if she had seen how long it took dad to go through just one tablet it would be amazing if the teachers had time to do that. As the school's technical support only comes in for one afternoon a week, she argues they would not have time to do it either. What this highlights is that the logistics of the busy household (and classroom) combined with the personalisation of use can lead to "children's" devices or spaces being invaded by things they may not be able to deal with, with responsibility for this falling between the cracks.

I observed a slightly different example of this when Ben showed me a game *Adventure Capitalist* on his tablet. Whilst playing, the following text appeared on screen:

> Screen 1: Pssst! Looking for a quick boost? Watch this …
> Screen 2: Please stand by. Adventure is the lifeblood of capitalism.
> An advert is played
> Screen 3: Thank you for watching. Enjoy your boost!

It is not clear that he understands this is an advert:

> Ben: I'm just watching a video and then I get a boost for four hours.
> It's a video. You have to watch it to get an award

Even though the language and framing of this gave hints that this was an advert, this seemed to go completely over Ben's head.

> Ben: It says 'We are factoring your bonus'. That means you can get a bonus by watching the videos.

However, they are obviously effective as Ben tells me he has often chosen a new game after seeing one of these:

> Ben: I downloaded a game from that. It's very good … I got *Adventure Capitalist* from *My Senior Monsters* and I got *My Senior Monsters* from *Fruit Ninja 3*.

This happened several times on both boys' tablets. Luke's response was the same.

As well as at a material level, the boys' engagement with their home devices is also heavily shaped by the **social** interactions of the family. Mum sees tablets having changed the dynamics of family life:

> Mum: They were aware of the computer and they were allowed to play CBeebies games and things linked into that on the computer but that was very much us sitting there and playing with them at a younger age. But when the tablet arrived in the house it was portable and could be taken around the house and she'd [sister] sit in the middle and they'd sit either side and they'd see what she was doing so that was when the whole technology thing came to the front

Much of what the boys know they have learnt from their older sister. She was the first one to get into *Minecraft*, she has also shown them YouTube and Spotify:

> Mum: They've learnt Spotify through her. I don't know how Spotify works. I'm still old-school. I'll go and get a CD and put it on

If they are stuck they will often ask her how to do things. They also help each other, for example one twin reads up on stuff (ie in *Minecraft* books) and tells the other what to do and they do it together. For lots of activities therefore the parents are not involved:

> Mum: Just the three [siblings] play. We wouldn't know what to do

In terms of co-use between the boys and mum, there are some occasions when things crop up in everyday life that lead to looking things up online. When it was

'Twits Day' at school mum looked up pictures on Google Images for costume ideas with the boys watching and they sometimes look up pictures of baking. If there is schoolwork to be done, mum likes to help but even there recognises that her daughter is more competent:

> Mum: If he was making a PowerPoint I'd sit with him and I'd probably get [his sister] involved

The boys say they would ask their sister for help more than their mum. But if dad was around they'd ask him.

Mum: I do feel like a dinosaur. If I didn't know something and [husband] wasn't in the house I'd ask [daughter] which is awful

In fact she also recognises that Ben is probably moving ahead of her in terms of functional skills:

> Mum: If he'd have said 'mummy can you show me how to do a bar chart in PowerPoint?' I'd have been, um, can we just Google some kind of help thing or whatever, but he has the confidence to sit and play around with things and not be worried if it goes wrong and just get on with it, press that button and that button

By being open to learning from the children, mum appreciates that they "go forward as a family together". In fact in this household the **pedagogical** practices could be best described as multi-directional and mutual. Whilst I am there an occasion spontaneously arises where mum is called on for help. As we are talking Luke remembers he has some Beavers homework to do to get his 'Aviator' badge.

> Luke: What do I do?
> Mum: So you can go to Google Chrome and just put in 'What is an aeroplane?' or something like that and you were going to do some writing. Do you want me to get you a bit of paper?
> Luke: Actually I'd rather … mum maybe I'll do it tomorrow cos that will be easier
> Mum: But you were starting it weren't you? What was the bit you were struggling with?

Mum is constantly juggling, both logistically and in terms of the roles she plays. Throughout this episode, as well as managing Luke's emotions and use, she is overseeing her daughter who was taking responsibility for cooking the family meal by herself.

It looks to me like instead of pressing Chrome he pressed Google Plus, which took him to something he appeared not to understand.

Luke: And by the way I hate you

Mum: What about if I helped you get into the Google search? Would that help?

Luke: Hmm …

Mum: We could do without Script [music] in the background

Luke comes back with some paper. His sister shows him how to do it this time.

Sister: So if you go onto Apps and then you press Chrome [a message comes up saying Chrome is blocked] Mum! You have to enable Chrome. It's blocked so Luke can't do his homework

Mum: I'll be right there … I just click this button

Luke has gone again.

Mum: Everything's like that. He goes off. But he's getting better at coming back. [Shouts to him} What do we want to find out? What was our question Luke? What did you want to know about aeroplanes?

Luke: [Shouts from outside] I wanted to know how their engines work

Mum: Right. So come back in and I'll type it in for you

Outside Luke is asking Ben if he knows the answer. Mum calls him back

Mum: I've got a great question. Can you come and see if this is the right question? It's just come up on the search.

Luke: I asked about engines

Mum: Yeh but that's quite a big thing to write. Would this be the kind of question you were looking for- 'How do engines work on a plane?'

Mum: So if you click that bit, the bottom one, would that help you? So what about that first one, that NASA one? Might that be useful? [Reading] 'The blades run at high speed …' Give us a shout if you need me darling. I'm just going to do my potatoes

Mum: [From kitchen] Good boy. Well done [He is writing]

Luke: Woah! That's how the engines work [he has found a picture]

Luke : Oh man [Google has timed out]

Mum: It must be on a 5 or 10 minute timer. I wonder how I can get it off? It's a bit annoying isn't it? I don't know how … I think I need to permanently uninstall it

Sister: [Correcting] Unblock it

Mum: Right I've taken the block off, which means I've got to remember to put it back on again

Luke's mum supports him emotionally (through patiently encouraging him to keep going and overcome his frustration), functionally (through managing the unblocking process) and pedagogically (through trying to help him define a question), whilst it is his sister who supports him more at the screen interface with how to navigate his way around. His use has effectively been shaped in multiple ways – the Beavers task, his mum, his sister, the *Screen Time* app and Google itself. In the end, the 'find' is a picture of an aeroplane engine, which seems to make things clear to him. However, even at this point he does not use the picture to help with his task. Instead he spends the next ten minutes copying out a passage of text, perhaps a missed opportunity.

This home environment is a dynamic and responsive one, where the balance between control and freedom is regularly reviewed and the roles assumed by different family members depends on the logistics of the situation. It is interesting to take a step back and look at where reflection about various aspects of engagement with online devices is emerging in this family.

Emergent understanding and reflection

It seemed that at a basic level there had been some discussion of time restrictions being part of maintaining a **balanced** life and recognising the **emotional** effect devices can have. However, in terms of the other dimensions of reflection identified in my literature review, the above example suggests that although mum was clearly scaffolding Luke's use of Google, once he found something he thought he could use, he was left to get on with it. She had previously told me there had been no need yet in her opinion to have a conversation about the **trustworthiness** of information online:

Mum: They're not really doing much stuff like that. If we have done it's been on the BBC website that I'm perceiving to be true and real … I probably haven't said that out loud [why BBC is trustworthy] and maybe that's naughty of me

There had also been potentially a missed opportunity to use or discuss the **image** that Luke had been most engaged by, as part of his research. In retrospect again, the reason for this is something that would have been interesting to follow up on.

Mum's perception of issues that might need discussing was more focused on inappropriate content or contact that might come up. When explaining why she had not specifically talked to the boys about this, she said firstly that she preferred to create safe spaces for them whilst they were young:

Mum: I think we could address it as a family [with a conversation] but at the age of six or seven I'd rather they weren't coming across it in the first instance

Secondly, she thought they were too young to need specific advice because they weren't actually doing anything that warranted it.

Mum: We tend to feel that it's OK to do things like *Minecraft*. I think that the *Minecraft* that they're playing on at the minute is safe cos they're just playing with each other

In practice however the children already see themselves as playing in 'mutiplayer' mode because they are playing with each other. When I ask if they play in the same *Minecraft* worlds together their sister replies:

Sister: Multiplayer yeh. It's good cos I get them to help me when I build huge things. At the minute we're building a hotel which is absolutely huge. An underground spa hotel.

The boys' are therefore already beginning to understand connectivity through experience of local connections they are part of:

Ben: We all have different playlists but we're all logged on to dad's account"
Luke: Basically me and [brother] are on the same account … I listen to his playlists

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Ben: "[Sister] paid for it [*Minecraft*] and because we're on the same account it comes up for free"

Sister: Dad's synchronised our tablets so I paid for *Minecraft* but they get it for free because I paid for it.

Ben: You can connect the worlds. I need to wait for you … I'm on. I want to see if my multiplayer is on though

Sister: It's on a server

Ben: You can only do it on a server

Sister: We're all on the same server cos we're all in the same house

[They have met in *Minecraft*]

Ben: What should I do?

Sister: Show the underground spa bit

I ask if they talk or write messages to communicate

Sister: We do sometimes. If I'm upstairs and he's downstairs we type. And also sometimes he won't listen to me so I type in messages. He was like killing my sheep and I'm like 'leave my sheep alone' and he wouldn't listen so I typed it

It could be argued that through their lived experience the children are beginning to gain an understanding of the affordances (and downsides) of being connected.

Anna

School portrait

The first time I see Anna trying to use a computer she is working in a group of girls. They make two attempts to start a PowerPoint but both times the computer crashes or comes up with an error message and they give up. Some lessons later, she is again working in a group of girls on a PowerPoint. However, this time they have been shown by the teacher how to insert a hyperlink into a PowerPoint and have been given the specific task to try and do it again. However, they start by paying a lot of attention to the design elements of the screen – choosing, placing and resizing photos to achieve a pleasing layout. They use two different ways of finding pictures – Clip Art and Google.

When using Clip Art they are clicking on blank boxes that have no previews of pictures and waiting to see what picture appears.

Sometimes these are pictures they already have.

> Girl 1: Oh no not that one again
> Girl 2: No no no way

The fun of the activity is in sharing appreciation or judgment of the images:

> [A page of Google results appears with some picture of shells on it]
> Girl 1: Wow
> Girl 2: See … see where shells can take us
> Anna: Weekee [reading Wikipedia]
> Girl 1: What do we type in?
> Girl 2: Just press one and look at it

They seem to be looking for pictures before adding hyperlinks. This suggests they have understood the activity as another design element. In the course of this short interaction there are several instances of language and concepts that are not understood.

> Girl 1: It's buffering [said in funny voice]
> Girl 2: I know what that means. It means it's not working
> Girl 1: Buffering is really stupid. I don't like it

When they are navigating to try and insert the hyperlink there seems to be underlying confusion about what it is which means they don't really know where to go:

> Girl 1: Layout?
> Girl 2: We need hyperlink
> Girl 1: No layout
> Girl 3: I know how to do it
> Anna: You don't have to put a hyperlink in every one
> Girl 2: Do you really want to take us to Google?
> Girl 3: We could go on Google Chrome
> Girl 1: We don't want it to take us to Google

> Girl 3: We're not going to Google, we're going to Chrome
>
> Girl 2: Um … no we're not
>
> Anna: Yeh we are. Look, Chrome

Once they do find it, their continued confusion about what the various terms means, leads them to improvise:

> They find 'Hyperlink' on the menu
>
> Girl 2: Hyperlink. Look it says hyperlink. Fiiinallly!!
>
> Anna: What shall we press?
>
> Girl 2: It says 'address'
>
> Girl 3: That's what you want
>
> Girl 2: I'll just write 'images' that's what it said
>
> Girl 1: You have to write [name of class]
>
> Girl 2: No you don't
>
> She types 'images of shells'
>
> [Computer monitor offscreen] Copy the website you want
>
> Girl 2: Go away
>
> They go to slide show
>
> Girl 2: Let's double click on …
>
> They get an error message

Although this episode had been pedagogically 'framed' by an earlier demonstration of how to insert hyperlinks by the teacher, the girls' actual activity was not that different from previous episodes where they had enjoyed image sharing and commenting. In terms of their understanding of hyperlinks, this appeared to be hampered firstly by their confusion around the language and icons of the screen, and secondly by not really understanding the purpose, which was removed from how they actually experienced the social enjoyment of PowerPoint.

Family portrait

The family live in a large, semi-detached house close to the school. Anna has a younger brother who is 3. Her mum and dad run their own plumbing and heating business, mum does all the accounts and administration. She tries to fit this into two days a week. As part of her work mum manages the website, and uses Twitter and WordPress:

> Mum: I update it [the blog] about once a week. It's hard to think of interesting things to talk about plumbing on a daily basis!

In her personal life mum also uses Facebook, Instagram and WhatsApp. However, she has heard from her older nieces about "horrible things that have gone on Facebook" and she worries about the effect social media is going to have on her children's lives:

> Mum: I think it's going to have a big impact on their generation, they're just not going to be so confident at face-to-face communications and things like that. I wouldn't like to encourage it and even as an adult obviously I use Facebook and social media and it is pretty addictive, it's like another little life that sits on your phone

At home Anna likes to do craft things, she builds camps with her brother and plays Lego. Outside she goes roller-blading or scooting and as a family they go swimming and have an annual pass to a nearby theme park. There's also always some kind of project to do around the house:

> Mum: They get stuck in. [Her brother's] into daddy's tools and that kind of stuff. They fit quite well into their stereotypical gender roles, they're quite happy doing those sort of things.

When her friends come they "go up to her room, close the door, get the nail varnish out."

The first thing Anna and her mum show me on the laptop is a website they have visited previously together when doing some homework about nocturnal animals.

> Mum: Did I make you a folder? I can't remember
> Anna: You saved it in the recipes
> Mum: No, that was I bookmarked a page for you
> Anna: No you also saved it
>
> Mum: And how did we find this website do you remember? Cos it was one from school and I said you need to tell me the web address [points to URL] but you didn't know it so how did we find it?

> Mum: We looked at Google Images didn't we, which is the pictures page and you recognised the pictures. And then so we didn't lose it again we put it in this folder didn't we? We made a folder for it

> When Anna shows me what she did she goes to each item on the menu and reads out what is written

> Mum: We did get a bit frustrated didn't we, working together on it? Would you say? Sometimes was it a bit irritating? Cos mummy was saying you mustn't just copy what's written

A key feature of this episode was mum's attempts to scaffold Anna's interactions by demonstrating, explaining and instructing using precise terminology. There was a strong sense of using the website "properly" to which I will return.

Anna's practices

Anna's family was the only one in the study not to have either a tablet or a games console. The only online device Anna engages with normally is her mum's laptop. She always does this with her mum and it is usually to 'do research'. During my visit Anna and her mum described two things they had done online together recently. The first was looking up information on nocturnal animals in relation to a school project; the second was looking for a dress for Anna to wear to a wedding.

However, recently Anna has also started being introduced to things online in the house by her cousins, who have iPads and are allowed more free rein.

> Mum: I'd set them up a party in her room. They said they wanted a party so I'd put music on and put balloons up and then when I went up they were all sat round the iPads and she was watching *Frozen* clips on YouTube. They'd shown her how to do it so I was just like .. I'm in my own home and it's not what I want

Anna appeared to be the least motivated by device use out of all the children in this study. She sought her mum's approval before doing anything, and even in

the classroom told me she didn't really enjoy using computers "because mummy's not here to help me".

Aspects of context

At the **material** level, in the house the adults both have smartphones and laptops, but there are no tablets. None of the devices are seen as 'the children's'. The children only really use the phones for taking or looking at photos, either of "Lego or themselves or me [mum]'

> Mum: There's nothing really on there that they can do cos it's locked…they don't know the password. All they can really do is swipe up from the bottom and get the camera so that's it. We've got no games so she doesn't try to play on it

Like other mums she has made a big effort to provide a safe, managed space for Anna's use. One thing in particular that she has invested time in, is in curating the screen, the ways that Anna might navigate to the internet and the sites she gets access to once she is there:

> Mum: She's got her own 'Anna's internet access' em it's taken a bit of research to find out the best ways to do things but school had taught them Google and at home Google's like wide open so I don't want to use that … So that takes her to Google Kids Search or something along those lines, I forget exactly what it's called, but it's just like a kids search engine

All decisions about content on the family devices are conscious and **value driven:**

> Mum: [Her dad] did have a while ago a couple of things on his phone and then I said to him I don't really want them getting into playing on phones and things … As soon as I saw that they kept asking for it and [her brother] was starting to talk and saying 'I want to see the cat thing' and it was like you could double click on it and you would give a cat a slap in the face and I was just like … this isn't you know .. it might be mildly amusing but it's not something I want to get into so I just said to him let's not start. It's so addictive. I just don't want to even get into it

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Mum's observation of the effects it has had on other family members has reinforced her belief in the negative impact of giving devices to children:

> Mum: So [my nephew's] 8 and he's really got addicted to this *Dragon City* and my sister tried to set up boundaries saying to her husband let's have certain days certain times, time limits and he was just like 'no it's fine, if he wants to play it let him play it' so you know it's just a little game on the phone but now it's got to the point where we pick him up on a Tuesday and he's really grumpy and he says 'oh I just want my dad to pick me up, when's he coming because I want to use his phone'

However, mum feels she is in the minority in worrying about things, and that most other parents don't see any harm.

> Mum: I feel like it's catching up with us before we really know what we're going to do about it and some people are just cool with it, it's fine just give the kids the iPad whenever … They're not really aware of the dangers that are there, even within just games and things, I don't think

She feels that her values are out of step with those of other parents:

> Mum: It used to be when I was little and you'd go to someone's house it would be, the parents would sort of say, are they allowed … do they watch TV or can they watch a video or stuff and now it doesn't seem to happen and we've had a few instances where she's said 'oh I played *Minecraft* and you can burn the baby chicks and …' and I was a bit like, we need to look into this

She even feels that school has opened the door to things without necessarily preparing parents and children for it:

> Mum: I almost felt like school had almost taught them to do something [use Google] without letting us know. It's almost like saying 'oh we taught them to cross the road by themselves' and then they're running off and no-one told me … If school are going to open that world to them then they should either let us know or make sure … they know they're safe at school but like they don't know they're safe at home. They can't just say well it's nothing to do with us.

As these examples suggest, **socially and emotionally** device use appears to be perceived by mum as slightly threatening. She even perceives her own work

use of the computer in a negative way. Sometimes whilst she is working, mum lets Anna's younger brother play on CBeebies next to her.

> Mum: He will actually mimic as well, he's got a little toy *Bob the Builder* thing with a keyboard and he's quite interested in pretending he's on his computer. Even then I still feel a bit guilty and I'm like "OK that's enough now, let's put that anyway and get some pens out' I think they probably see me using the computer way too much.

However, in spite of these worries, mum also believes it is important to try and scaffold Anna's use:

> Mum: I wouldn't want her to be held back [cos] there's loads you can do that is useful. I've more been focusing on the dangers and the worries but actually I don't want to miss out on teaching her all the positives

Although what these "positives" are remains a fairly vague notion:

> Mum: I'm having to learn it and I'm going to have to try and work it out but like it's a bit of a challenge at the moment trying to know what's right … There's massive gaps I think for people of my age who haven't quite caught up with what is available

In terms of **pedagogical** strategies, it was with Anna and her mum that I observed the most overt scaffolding of use. What was interesting was that this scaffolding was as much around how to navigate and access content as it was around the actual activity itself:

> Anna: So I went back to where it says like my name [the icon on the homepage that says 'Anna's Internet'] and then I click on that and type in what I want
> Mum: In the search engine do you mean?
> Anna: Can we get back on to it? [Mum navigates there]
> Anna: [Typing] Pictures of … dresses you can wear to a wedding? How did you find out?
> Mum: I think I put in 'girls blue dresses'
> Anna deletes 'pictures of' and types what her mum just said

Throughout the session mum again makes a conscious effort to help Anna 'read' and manage the screen. She talks through the process of what they are

doing taking care to use precise terminology and pointing to areas of the screen that relate to these words:

> Mum: And how did we find this website do you remember? Cos it was one from school and I said you need to tell me the web address [points to URL] but you didn't know it so how did we find it?
>
> Mum: We looked at Google Images didn't we, which is the pictures page and you recognised the pictures. And then so we didn't lose it again we put it in this folder didn't we? We made a folder for it
>
> Mum: We did get a bit frustrated didn't we, working together on it? Would you say? Sometimes was it a bit irritating? Cos mummy was saying you mustn't just copy what's written

She patiently repeats things, trying to correct misconceptions. For instance, repeatedly drawing attention to the difference between bookmarks and folders as ways of saving different things:

> Anna: Other bookmarks? Shall I click on that? It might have my PowerPoint on it
>
> Mum: No that's not where your PowerPoint is. Bookmarks are just pages
>
> Anna: Recipes!
>
> Mum: It's down there [points]. But this is just websites darling. Is isn't where your work is saved. It's just web pages

> Mum: Did I make you a folder? I can't remember
>
> Anna: You saved it in the recipes
>
> Mum: No, that was I bookmarked a page for you
>
> Anna: No you also saved it

Recognising that some of these are metaphors, she sometimes highlights this for Anna, trying to make things seem logical:

> Anna tries to go back to the previous page by clicking on the back arrow

> Mum: That would be one way but another way could be this [points to tabs] how about this one? What do you think that is? It's like pages of a book isn't it? Why don't you try that?

> Anna clicks on tab and goes back

However, although she is pointing there is often not a clear visual reference point to reinforce the language mum is using. In addition, mum is not quite spelling out the difference, for example between things Anna is finding and things Anna is creating and whether they are online or offline. In this session therefore the links were not quite made. Nonetheless, that is not to say that through more guided time like this, a visual conceptualisation of the world beyond the screen could not be built.

Eventually, in spite of the more child-friendly way of doing things she has tried to encourage, mum realises that when they did this before they had actually just used Google Images. She types in more precise keywords and a more appropriate range of dresses appears. In the search for a wedding dress it was ultimately mum's use of adult search engine and an adult combination of words that was the most successful way of getting to a good place for Anna.

> Anna: Those aren't children's … it can be a bit annoying
> Mum: You have to learn to tell the search engine just what you want to say
> Anna: I put 'girls blue dresses' I thought it was kids!
> Mum: I think mummy did it didn't I? We got a rough idea of what you liked and then we went to different websites like Next and Monsoon, do you remember?
> Anna: On the internet you can type in Next and it will show you things from Next
> Mum: And you know you can buy things on the internet
> Anna: And you can see what you like

Conceptually, the thing Anna does seem to have grasped is the fact that a shop like Next, can be either a real place or a place. In itself this is a building block, and should not be ignored.

Emergent reflection and understanding

Anna uses devices the least but has discussed the consequences more than most. As well as making pedagogical attempts to equip Anna with the tools to help her engage reflectively and efficiently with online devices, Anna's mum has also spoken to her more broadly about some of the consequences of online engagement. Implicit in these conversations are notions of **balance** and

trustworthiness, but in a very general way. She says that Anna seems to accept her mum's view of things:

> Mum: I've tried to explain to her that I think that if kids play games on phones and on laptops that they could forget how to play so she's kind of accepted that … she's kind of like 'OK I don't want to forget how to play'

In fact, mum has observed that these conversations may have made Anna overly cautious about device use:

> Mum: I said to her sometimes if you're on the computer people might ask you personal details which means you know your name, where you live, what school you go to and I sort of said sometimes people pretend to be who they're not because they want to know things about you, you know naughty people and she was then getting really worried she did a bit of writing and she was saying 'oh [another child] showed me how to save it but I don't want to write my name in because you told me I shouldn't write my real name'
> Me: And that was on a Word document?
> Mum: Yeh that was just in Word …but she's a very cautious person anyway
> Me: So in her mind anything that 's on the computer …
> Mum: … is open, yeh. She doesn't make a distinction between the internet and
> …

Both at home and at school Anna appears to experience her practices as framed by ideas of "proper" use. It could be argued that because these discussions are not linked to Anna's lived experience, they remain abstract. In addition, we have seen that she still struggles to see the difference between online and offline as represented through the visual and verbal language of pages, bookmarks and so on. This could be leading to her engagement being shaped by one particular view of technology as threatening.

Will

School portrait

The first time I saw Will in the classroom he was unable to access his work on a netbook because he did not know his log-in details. Despite the attempts of a

teaching assistant to help him, the problem was not resolved in the half hour of lesson time I was there.

> Will can't get netbook to work. He asks a TA who says 'I haven't actually used these little ones' The TA asks Jack [computer monitor]. Another boy comes over and sits next to Will and tries to help. Then another comes over 'Just put your name in – don't do a finger space'. Harley has appeared. TA says 'Maybe it's because there are two Wills. Harley says 'Put William in'.

> TA says 'Maybe for you we have to put in the full surname'
> On screen it looks like it might be logging on
> TA 'It's only saying 'welcome' not 'welcome, you are in'
> This doesn't work. Teacher suggests that Will goes to the office to find out what his log-in details are.

> [When he comes back a few minutes later] I ask Will what's happening with his netbook. He has given up – the office didn't know his log-in details. Teacher leaves her guided reading to ask him what is going on. Suggests 'It might be Will *** [first letters of surname].

> Teacher asks 'Will what's your middle name? Try Will *** [initials including middle name]' Another child says there are just no log-ins available and the teacher says 'Oh so the system isn't working'

> Field notes, April 22, 2015

However, every other time I saw him in the classroom Will was involved in some way with computers. Primarily he was one of a few boys who worked as a group to research and create joint PowerPoint presentations. I observed this group over at least three lessons and the main feature of their engagement related to social dynamics. The following episode is characteristic of several of their interactions.

> Boy 1: Sam and Freddie [reading out names on PowerPoint]
> Boy 2: Why have you just done that?
> Boy 3: What you deleted me?
> Boy2: No he deleted me!
> Boy 1: I don't see why you should not write my name on yours
> Boy 2: I'll write your name
> Boy 3: If you delete me then ..

Boy 1: I didn't delete you. I wasn't meant to delete you … I was just deleting myself

Boy 3: If you do cos that's on my account

Boy 1: That is my account

Boy 3: All it started was I started making a PowerPoint and you said 'oh can I do a PowerPoint with you?'

Boy 1: Can I make it with you please?

Boy 2: I'm just going to be sad for the rest of the day

Boy 1: I've just deleted myself on this as well

Boy 2: You deleted me cos you don't think I'm any good

Boy 3: It's because Freddie, you don't tell that you're on my account

Boy 1: I didn't know I had to tell you

A bit later

Boy 1: Jake do you want to be on my PowerPoint or not? … I'm putting you on

Boy 3: Why should I care about the PowerPoint if I put so much work into it and you delete it?

Boy 1: I'm putting you on

Although Will was part of this group of boys he tended to watch from the side-lines. On another occasion the social dynamics of this group took more of a tone of shared enjoyment as they engaged in another activity I saw frequently that I coded as 'image scrolling'. Here they spent the entire lesson going through a page of Google Image results either identifying what a picture was or passing value judgments on its fun or interest. They then printed out the page and cut bits out to stick on a PowerPoint they had also printed out.

It was notable that Will moved round the classroom a lot. He was hardly ever to be found actually sitting down. He would be wandering, standing behind people, looking for or at things. Typically Will was not the one actually with his hands on the computer; rather he would contribute by making suggestions. As will become apparent, this was in stark contrast to how he was at home.

Family portrait

Will's family live in a suburb of the city in a three-bedroomed terraced house. Both parents work, mum as part of the family cleaning business and dad as a teaching assistant in another local primary school. Mum is also a governor at

the school. They work shifts in order to be as available as possible to Will who is an only child. Both sets of grandparents also live close by.

Mum describes herself and her partner as "both quite geeky, so we like our games, gaming and stuff, especially in the evening … our culture is Xbox". They also use the internet at work. Mum is in the process of developing a website for the family business and manages a Facebook page. The family is technology rich, owning an iPad, two Xboxes (one of which is in Will's bedroom), a Wii and two laptops (one for work) and both parents have iPhones. In spite of this, neither parent feels particularly technically savvy "[although] we're getting better. Between us!" In the living room there is a shelf of computer games both child (*Lego, Fifa*) and adult (*Call of Duty*). There are also many board games visible – including at least three versions of Monopoly (Skylanders, Disney and Marvel). Although devices are clearly an important part of family life, there is a sense that online life and offline life are balanced and complement each other:

> Mum: We've started building, we've got a board, and he wants to actually physically build a *Clash of Clans* world that he can then put his Lego figures in and make his Lego *Clash of Clans*

Although Will has been part of his parents' Xbox culture from a young age, the iPad and iPhones are a relatively recent introduction to family life. In fact it was his grandparents who initially introduced him to these devices and the games on them:

> Me: Who do you think is most into it [*Boom Beach*] out of all the family?
> Will: Grandpa

On my first visit, when Will opens the iPad *Clash of Clans* is on the screen so he shows me some of that. Together with his mum and grandad, Will has started taking part in this multi-player strategy game. Mum also gets her phone out and she has same thing on her screen.

> Mum: I've already done my attacks, so I can watch the attack that you do on my phone can't I? While you're doing it

I ask if they chat normally while they're playing

Mum: You usually try and explain or teach me what's best to do don't you?

Will also plays with his grandad remotely on *Clash of Clans:*

Mum: He'll send messages saying 'Ha ha I just burnt down your village' or something like that on our phones

There is a sense of continuity therefore between Will's offline and online world. Gaming takes place in a context of family connection – both materially and emotionally:

Mum: He's done it once with me when he went to stay at their house [grandparents] for the night and we were both on the game and he sent a thank you message cos I'd given him troops and I sent a message back and then we actually had a little .. kind of like a conversation but it was .. you wouldn't be able to tell we were mum and son cos it was more like smiley faces and hands [?] but I was I'm going to stay cool but you know I just want to tell you that 'night night' [laughs] which is really good

Will's practices

Playing games is what Will enjoys doing most with devices. He frequently does this with his parents or grandparents. Mum describes how "the Lego games and stuff I'll sit there and play those with Will quite happily. Whereas [his dad] will play *Fifa* with him". He also spends a lot of time on his own playing *Minecraft*. As well as playing games there are various other activities that Will engages with on the many devices in the house: taking photos, performing for videos, talking to family members, texting friends (via mum's phone), searching for things, creating things and downloading. Sometimes he uses his devices for "educational" purposes. He has used Google to search for information related to school topics such as the great fire of London and with his mum he has accessed a website called NRich which offers maths challenges. However, "searching" for Will is more likely to mean browsing the App Store for games or YouTube to access vloggers' channels such as Master OV, Stampy or Ballistic Squid:

> Mum: He'll watch YouTube videos to get to know how to play particular things, so like [his granddad] has generally introduced him to the beginnings of all of these games and then he'll sit there and watch a couple of YouTube videos to get to know how to play them.

I observe Will playing *Minecraft* on two occasions and both times it appears to be a calm and constructive experience, with gentle music playing in the background. Whilst he is playing Will appears to really concentrate, and I can see that he tries to improve upon his building. Mum has clearly either played or watched him playing before and shows she places value in it:

> Mum: Why don't you show the one you did on the iPad cos you made a YouTube sign on here and you made like a whole rollercoaster didn't you?

Will has populated this world with characters and objects that reflect his wider interests in the *Minecraft* universe: for example, he has made several attempts to create large YouTube signs that can be glimpsed as you take the rollercoaster ride:

> Will: I'm building a YouTube sign, I think it should be a bit smaller
> Will: I just like doing stuff like that cos I watch Stampy quite a lot and I watch Ballistic Squid and they're all on YouTube
> Me: Is that redstone that you're making it out of?
> Will: No I'm making it out of …. wool. But I don't think I should do this. Cos it could just get zapped by lightning and fall apart

There are also giant Stampy and Ballistic Squid characters, and even one hybrid, that form part of the scene.

> Mum: You've got Stampy Cat and Ballistic Squid on there haven't you, that you made?
> Will: I think Stampy's better
> Me: So what you've made them in *Minecraft*
> Will: I think Stampy's better out of these two
> Me: And did you just work out how to do that?

Will: I think Stampy's better like when I built it, but I think Ballistic Squid is better on YouTube. That's a random Stampy that I did. I don't know why. I've done loads of Stampys now. There's like a Stampy mixed with Ballistic Squid.

Me: Is that that one there?

Will: Yeh

[Mum] It's a half and half wasn't it (Around 4.30 on the video – for screenshots

As well as curating an environment that reflects his interests, Will also appears to enjoy the visual identity play possible in *Minecraft:*

Will: Now I look like a snowman … and now I'm a little gingerbread man. I can be all kinds of stuff!

For Will, playing games like *Minecraft* and *Clash of Clans* is not easily categorised as one thing. Rather they seem to offer a combination of opportunities: for creating, communicating, relaxing and identity play. Technology is very important to him. He values it for its fun and the shared enjoyment of play and at home he appears to be a purposeful user, immersed in its culture and keen to develop independence and mastery.

Aspects of context

At a **material** level much of the house is a visual celebration of popular culture, suggesting a shared joy in these worlds – there is a *Batman* bath mat and *Star Wars* wallpaper. Mum tells me "if we ever [get a Lego Death Star] ... cos it's something that me and Will both want .. if we ever get it it will have to be a display piece". It is clear that care has been taken to create a playful home environment:

Mum: All his games are now in the spare room so he's got pretty much two rooms now, which is quite nice … and we've got all the art supplies set up in there too now so its accessible to him. Cos before it was all in cupboards under the stairs .. It's something I've always wanted to do is have it in set places so you can literally go to a drawer and get paper or … He knows like all his toys he can get to them

The iPad and games consoles are shared devices, but all are available for Will to use as long as he asks. Typically he is allowed to go on for an hour in the morning before school and then an hour or so after school:

> Mum: At weekends he tends to be on it a little bit more cos he has kind of free rein of when he goes. I know that he's quite sensible and the fact that he wouldn't sit there for hours and hours on end. He does put it down when he's fed up with it and ask to do other things

Culturally the way devices are domesticated in this household emerges from clear shared values and enthusiasm about the affordances of technology. As far as mum is concerned playing with devices is another way in which Will is learning. She sees *Clash of Clans* for example, being good for perseverance, patience, teamwork and Maths:

> Mum: So I so think, like I know there's a lot of negativity about iPads and things in general when it comes to children using it, but it is teaching him good habits as well

With *Minecraft* she has had her views changed by watching what Will does:

> Mum: I couldn't understand the reason why kids loved it. And then I kind of sat with Will and played it for about half an hour and I was addicted. I had this most basic simple house built but it was the fact that I'd built this house all by myself with all the colours … The stuff he builds and the stuff he makes from nothing I'm just absolutely amazed with. The imagination it must take to just do that.

Although they have introduced him to certain things, their own practices have also been shaped by Will's choices:

> Mum: If it wasn't for Will I wouldn't have gone near those games [things like *Clash of Clans*, *Minecraft*] at all cos they never used to interest me

> Dad: It's strange cos graphically it's [*Minecraft]* like playing something that we played back in the 80s on like a Sinclair Spectrum or something so .. but its actually really good to play isn't it?

There are also a number of examples of Will's parents listening to and learning from him:

> Mum: He teaches me how to use the iPad … I had no idea so he's taught me step by step on it ...He's almost the one who's shown us the app side of things cos we went with phones and then he was like oh well you can do this

Perhaps because they are so keen for Will to make the most of the opportunities afforded by game play, his mum and dad like other parents are also very careful to create safe, managed spaces for this. Mum does this by getting involved from the inside:

> Mum: You have the clan – this is the people in your clan, who are the only people who can talk to you … There's specific rules for particular groups so I've joined one where there's no swearing or bad language. There's a set kind of particular age groups and things … I've made sure that the clan that Will's in I'm in as well, so I see every single thing that's written or any comments that are passed

In terms of his access to YouTube mum has also pre-vetted where he is allowed to go:

> Mum: There's only one person that I'll let him watch actually, he's called Master OV. And he is very child-friendly and child-orientated and I've researched him before because he's got a Facebook page and I've watched some of his videos [and then] this Master OV guy has friends that also do ones, so I've watched some of them already in the knowledge that they'll be the ones he might want to go to next

> Mum: I've told him he has to be careful especially with YouTube like I've heard some quite horrible stories on that … But he's always known that there are certain things on YouTube that you shouldn't search

Mum's decisions about how to manage Will's use are based on the **socio-emotional** dynamics of family life. For example, she sees it as more important for Will not feel pressured by time restrictions:

> Mum: He gets quite stressed at school at the minute cos they put time limits on things and he then becomes obsessed with his work and he won't stop cos he

wants to complete it and finish it so I'm trying to not give him too much stress at home with time restraints

She is also keen to share his use in a supportive emotional context:

Mum: He tends to come into bed with us [at 6.30] and do it, so he'll snuggle in between us and normally he's making me do mine at the same time so ..
Me: So you literally open your eyes …
Mum: And I'm having to look at my phone yes. [But] it's nice that there's so much conjoined-ness with it

As everyone in the extended family uses devices and understands them Will goes to different family members when he is stuck: "I'd ask my mum for the Wii and my dad for the Xbox." Whatever the situation, whether for learning, communicating or playing, device use seems to be shared.

This is shaping his expectations of the affordances of different devices and platforms. He has seen his mum using Facebook "If he's taken a photo of me that's particularly interesting or amusing or the dog or something and he likes doing selfies as they call them, so we'll sit there as a family and do that" and he knows this is a way of keeping in touch with distant friends. However, by sharing Facebook use with Will a new shared use of the platform seems to have emerged:

Mum: He knows that if he connects into my Facebook account on games he gets extra rewards
Me: He gets extra rewards?
Mum: They give gems and things like that for the games because you're connecting it and introducing it to other people
Me: So that's a kind of way of marketing for the game, it comes up on your status that you've played
Mum: That's it, you've played this game so people are then interested in it. So he does have a couple of his games connected to my *Facebook* account but then he can't get into my *Facebook* account, if that makes sense, it just means that my *Facebook* wall is awash with the fact that I've played games or apparently I've got quite a few dragons

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This sense of jointly coming to an understanding and evolving new shared practices also appears when mum tells me that Will really wants to make a PowerPoint at home, because he has been doing it at school, but she doesn't know how to do them. On my second visit she realises PowerPoint is on her work laptop and she and Will together have a go at making something.

> Mum: We could have made that Roald Dahl poster [a collage they made together for school] on a PowerPoint. With the things coming in. Cos I assume this is where you can have the facts like 'pouring on to' the screen in different places and stuff? I would have loved to have done a PowerPoint to coincide with the poster

> Mum: That's awesome [learning PowerPoint] I like learning new things [laughs]

In addition his mum tells me they are both keen to understand the process of screencasting. She has filmed him talking about his world on her phone before and trying to explain things, but for now the videos just stay on her phone. While he is aware that things can be uploaded – this is not something they do. He is also keen to know how to make games himself:

> Mum: He's asked whether he can do a computer course cos he wants to make his own game world, he wants to do that sort of thing, he wants to learn that. But there's actually, I've even looked it up online and there's very little in the UK

In terms of more **pedagogical** shaping, the tactic in this family is to encourage as much open discussion about online practice as possible and there had been more explicit discussions about some of the potential dangers of going online than in the other families.

> Mum: Yeh we've had to explain to him that not everybody ... the online world isn't vetted by anyone so that's why mummy and daddy are quite strict on what you can do and where you can watch things from and stuff

Mum would rather engage directly in a discussion about whether or not a particular game is appropriate than just vet it, but to do this they try to "just merge it into normal conversation":

> Mum: [We'll say] well you can't do that, but we can look at this and if you want to get a particular game or if you want to look at this or look at that, we can then explore that together [because] if you just say no every time then eventually he's going to think bugger you I'm not going to bother then …. It's just about being open and honest and striving to make it so he'll tell us.

On one occasion dad brought home a Thinkuknow video about multi-player gaming environments, which he showed to X and they discussed.

> Dad: It was showing a child on a game and it was showing that all of these characters look really nice but then it shows you what they actually look like in real life behind the like fluffy teddy … We showed it to him and it was really good actually, really interesting. I think he got the idea of it … Cos its not being too harsh … its showing them in a way that they would understand without trying to scare them into like not playing anything

Mum talks about not hiding things from Will, but instead talking openly about them. For example, *Call of Duty* is visible in the house but there is a clear understanding that this is not something appropriate for Will.

> Me: And with films does he get the concept of there being age ratings for things?
> Mum: Films and stuff like that yes and games, he knows like which of these he can, there's no way he's going near ..

He appears to have taken this on board. At one point when I am talking to mum and dad, Will overhears what we are saying:

> Dad: We've found before if he wants to watch one of his videos of his *Minecraft* Stampy thing and then it will pop up with a video for another game and it will be like a *Call of Duty* type game and obviously it's not appropriate
> Will: Anyway I wouldn't watch *Call of Duty* or something like that
> Mum: I know
> Dad: No you're very good
> Mum: You're a rarity. You will tell us

This sense of what is age appropriate has also been discussed on the occasions when they have done some research together. Mum has tried to help Will be reflective about which source of information to use, encouraging decision-making based on avoiding information overload:

> Mum: Because you've got things like Wikipedia and the GCSE Bitesize and I actually showed him the difference between cos he was like 'I want to go on that one' so I showed him it was just like information and he thought it was really quite confusing and I was like 'exactly, so if we now go on to this one it's more set up for your age group which makes it easier for you to understand and probably easier for mummy to understand as well' There's only so much you can take in in one go

Partly as a result of their positive attitude, partly inspired by his enthusiasm, Will's parents have made value-informed choices about how to blend technology in to the social and emotional life of the family. There is some monitoring and restriction of use, but primarily their mediation strategy is characterised as mutual exploration and enjoyment coupled with open discussion.

Emergent understanding and reflection

This was the family where I observed most evidence of shared reflection about online practice. Mum and dad are keenly aware of the rapid evolution of technological and social practices around devices, and can see that they need to be flexible, open-minded and informed.

> Dad: I think that's the biggest hurdle as a parent now, I feel is internet safety …
> it's constantly changing so you can't just think I'll do my internet safety then I'll know it

Although they are technologically competent in many respects, the constant updating of devices is something that they feel needs to be reflected upon.

> Mum: I was shocked the other day that I could literally tell the phone what text message I wanted it to send and who I wanted to send it to. And I didn't have to touch anything. And it did it and it sent it and I was like …right go back to typing. I don't trust that quite yet. It was fun once but that could be dangerous territory. It could go to the wrong person

Across the family an understanding of the consequences of online engagement is coming in response to things that have happened experientially. For example, in spite of the iPad having "every parental control we could think of" there was

an occasion when Will ended up accidentally spending £125 whilst playing *Clash of Clans* "not realising he was buying stuff". This happened because at the time in-app purchases had not been disabled:

> Mum: He didn't realise what he'd done cos he was very upset when he realised what had happened. He just assumed that it wasn't working cos it kept saying 'unable to work' so he was just pressing it but apparently it was working

As a result of this episode mum disabled in-app purchasing and is now confident that he understands the commercial contexts he sometimes visits:

> Mum: Yeh he can browse the App Store, cos he won't be able to buy it anyway without putting the password in. He will ask before he puts the password in .. I have a lot of faith in him in that I know he knows when it will cost. Cos if it says just 'Get' then he knows it doesn't cost anything. He also knows that if it's got a cloud with an arrow it's already been downloaded so he can read that, he understands how that all works

In this household the move to a new device or a new mode of engagement can also becomes a conversation trigger. There is a sense of connectedness and therefore interchangeability between devices: games and 'worlds' can be accessed on more than one device, if one is used to communicate, this appears also on another (for example, the iPad 'ringing' when someone calls dad).

> [iPad starts ringing- it is connected to dad's phone] Does that show up on there? Yeh for some reason his telephone calls, particular telephone, I guess its cos its got FaceTime on it, his phone's connected to the iPad so if he gets a phone call it comes up. WIll's been playing on it before and all of a sudden its 'daddy your phone's ringing'

Alongside his parents Will is learning that a world created in an online game can be accessed on different devices – because it is 'stored' somewhere remotely accessible:

> Mum: It's the same world on [dad's] phone cos it's all done via the same account. I'm learning it all now [laughs] Because it's on [dad's] Apple account it's the same game so he can have it on that [iPad] or [dad's] phone … It's quite a difficult concept to get your head round anyway isn't it?

Much of their reflection comes from an experiential or insider perspective – they are reflecting on their own experience of use and using this to guide the conversations they have with Will. For example, all three generations in this family have experienced what it is like to get sucked into a particular game – mum is able to be self-reflective about this

> Mum: My mum found that cos she got introduced to *Candy Crush* by one of her friends and for a little bit she wasn't even bothered by it at all and then she was trying to get past particular levels and it became more and more like 'right, lunch break I'm going to have ten minutes of *Candy Crush* time' and that's what I do so we get into a bit of a routine with it I think … I can see why kids get addicted to it because you're interested to know how .. it's amazing if you've got five minutes where you're waiting for something it's .. you just quickly tap into it it's quite good to get away from the world for a little bit

His mum has also explained to him the role of moderators in online games such as *Clash of Clans* and taught him how to navigate the site for information that will keep him safe. This is paving the way for things like recognising the importance of privacy settings. In so doing, they have encouraged a way of participating, which involves understanding that there are codes of behaviour. As a result of sharing his engagement in online worlds with his mum, Will has therefore started to be able to reflecting upon good online etiquette and take responsibility for managing his own wellbeing:

> Mum: He will read the Clan Rules himself and he'll say 'that doesn't say they're
> not allowed to swear mummy so I'm not allowed in that one' and things like that.
> So he's got an idea as to where he can look to see what the rules are
> Me: So he understands that part of being online means observing certain rules
> Mum: Yeh. He then sticks with exactly what he's told

The evolution of reflective engagement is clearly a journey this family is going on together. In *Minecraft* they are moving gradually towards playing in more open multiplayer environments. Mum can see the appeal but wants Will to understand the implications. By scaffolding the process in a way that begins by linking virtually only with people who you know in real life, mum sees this as a way of making the conceptual multi-player environment more tangible. In this

way she is implicitly encouraging reflection on what the reality of joining a multi-player environment would be.

> Mum: The only Xbox friend he has is me and [dad] at the moment. So I can play downstairs and we can talk to each other on the headset. We've only tried it once cos we literally just did it this weekend to try it out so that I can then play games with him downstairs so we can't see what each other is doing Oh that's cool So it actually makes it a little bit more exciting because you can then try and find each other

> Mum: They do a thing called *Hunger Games* now as well where you have to find each other and get each other out of the game and things like that so that's the next step on from what we do now because Will doesn't play with other people on here. He's literally just on his own or I go on with him.

The main way in which reflective engagement is shaped at home is through co-use and shared enjoyment. Reflection is less about being functionally adept, more about understanding the contexts and consequences of use.

Lottie

School portrait

Lottie was a fairly frequent user of the class computers and I observed her making PowerPoints and a quiz and also searching for pictures for an offline book. She was clearly interested in multi-modal playfulness: on her quest sheets where she outlined the ways she would like to show her learning she wrote that she would create 'an episode of Deadly 60 TV programme', a 'picture episode' about the environments Roald Dahl used in his books and a 'photo family tree'. In her practice she was keen to customise her documents and would explore different buttons to see what they did. She saw PowerPoint as an opportunity to exercise choice about how to present things, for example using the honeycomb tool to change font colours. These activities were always undertaken with other children and a big part of this playfulness involved sharing appreciation of these aspects with the others. At the end of one PowerPoint, she types 'the end' then deletes it and retypes 'THE END'. When working on another I hear her partner saying 'Oh that is so good' admiring her

choice of template, before they both get the colour wheel and discuss how to make "MATHS' appear in big blue letters on the first slide.

However, in terms of the actual activities I observed Lottie doing, the most prevalent was either waiting for something to load or looking for work – effectively what might be seen as non-activities. One reason for this is that she has been given the same username as another child in the school. Another is that when she has collaborated with other people, there is confusion over who has saved the document and, more prosaically, how they spell their name. Another was the poor functioning of the school computers, which affects her attitude. When I ask her what she thinks of them she simply screws up her face and says 'I don't know'. On other occasions she mentions 'this computer is hard' and 'it's rubbish when it does this'. Arguably the final reason Lottie struggles is because of the way the school network is visualised on screen. Nonetheless Lottie uses a range of strategies to try and find missing documents, showing flexibility and an awareness that there are several routes to finding things (and therefore a degree of conceptual understanding of how the school network functions). In spite of the technical barriers she perseveres and indirectly this poor functioning leads to exploration and mastery. However, opportunities are also perhaps lost, a point that I will revisit.

At different times therefore her engagement is shaped by the material constraints of the classroom equipment, the peer-to-peer social opportunities and the pedagogical approach that allows her the freedom to pursue her own creative learning interests.

Family portrait

The family live in a terraced house with a sense of calm and order. It is beautifully decorated and tidy. There is a visual coherence to the house – even the green iPad cover matches the tones of the colour scheme of the downstairs of the house. On the wall there are lots of photos, particularly of family. Lottie has a young sister who is 6. Mum is a stonemason and dad is an archaeologist. On my first visit mum, dad and younger sister make pizza together whilst I chat with Lottie.

Mum's first comment about devices shows some irritation towards their encroachment in daily life:

> Mum: My phone broke last year and I didn't have it for about a month and it was lovely and I didn't even think about it, I didn't feel the need to go on another device. But because it's just with me all the time, and if I've got a spare moment, if I'm at a bus stop or I'm just by myself I will just look on Facebook and look at things and its' terrible, it's a real tick

In general this is a creative family, where 'hands-on' activity is valued. Lottie's bedroom walls are covered in things she has made or drawn. She tells me some of this is stuff she has done at school (such as a Samuel Pepys house and a boat she has made) and some of it is stuff she has done at home. She is clearly a child who likes making things. Mum tells me that she sometimes allocates a 'craft hour' on a Sunday. In addition, on one evening after school they go regularly to street dance and then back to a friend's house, one evening Lottie goes to Brownies and one evening a week they have the friend back to their house in return. So there is no regular after school pattern. When I ask her what she most likes to do in the evenings she talks in some detail about how she plays at being a teacher with her sister or her friend. They either read out stories to pretend children or draw on a dual whiteboard/blackboard. It is like real school 'only less work and more drawing'. There are no computers in this school. When I ask her whether she likes using computers at real school she is ambivalent but says she does use them 'cos then I'm not wearing my hand out so much'. When I ask her what they are good for she says 'looking things up'

At home the 'game' she gets most excited about is 'How Old Am I?' This is a website where you can upload a photo of a person and it will calculate their age. She shows me several examples, taking photos of other photos around the room and uploading them.

Lottie's practices

Lottie engages in a range of activities across various devices and she has a clear opinion about what different devices are "good for". She describes the iPad for 'playing games', the laptop as for doing things related to school (like at school she uses the laptop at a 'desk' at home) and mum's phone for games

and sometimes communicating with 'whoever mummy wants', but 'I'm only allowed if my mum says to WhatsApp my friends' (actually just her step cousin in London). In her bedroom she also has a CD player and an electronic diary, neither of which are online devices. They don't appear to be particularly frequently used; when she shows me the latter she has forgotten the name of the game she shows me and also enters her password incorrectly.

Lottie shows me a wide repertoire of apps and websites that she uses. Although there are several which are purely 'entertainment', Lottie does not seem particularly engaged by them. However, when she shows me a Maths app she seems more genuinely interested, taking time to explain to me how the game works. She also shows real pride when showing me things she has made that relate in some way to what she has been doing at school, such as PowerPoints, posters, quizzes or Maths problems (including in one instance, a specific piece of homework that involved Google Maps). Although these things could be seen as "educational" they are also creative. Lottie has drawing and music apps available on the iPad, the activity she shows me on her diary is a story-making function and her mum reports that they watch music on YouTube, which Lottie then learns on the piano. She also has access to Garage Band, which she has played with her granddad. In addition she and her sister 'both love, they're obsessed with looking at photos on it, they love looking at old photos'. There are times when her mum finds selfies on the phone and she reports that it is these, along with emoticons, that she sends to her cousin on WhatsApp.

At home, as at school, Lottie's predominant mode of engagement with both the iPad and the laptop is visual, whether she is searching (using images), communicating (using photos and emoticons), creating (experimenting with fonts and photos, making a family tree) or playing. Primarily she appears to enjoy the educational and creative affordances of these devices and is motivated by exploration and mastery. Lottie is confident in her abilities – "See I'm very good at this" – but appears to see this as normal: "I just did it on my own - I've done this before", "It's normally quite easy" and "I've played it lots".

Aspects of context

The **material** decisions made by this family are suggestive of certain values around device use. This is not a house in which devices are highly visible. The only screen apparent is dad's laptop, which is open on a side-table displaying what look like architectural plans. On the dining room table is the 'family laptop', which has been set up for my benefit in the place where Lottie would normally use it. It emerges when Lottie takes me round the house that the TV is 'hidden' in a cupboard and the 'music station' is discretely placed on a shelf above, indicating that when they are used this is a conscious choice. A Playstation referred to by mum in our interview as 'a hangover from pre-kid days' is nowhere to be seen and the children themselves do not mention it when asked about devices, suggesting they are possibly unaware of its existence. Both parents have smartphones, which the children report as being 'kept in their pockets'. However, mum can see things shifting. On occasions when her phone is left visible Lottie (but not her sister) will use it opportunistically:

> Mum: 'Yes actually Lottie does pick up my phone quite a bit, so she's getting more and more that she wants to … she's … my step-brother's daughter is a bit older and in London and they What's App each other so she'll quite often say can she use it to What's App [step-cousin] and then I know she's been Googling things on it as well. She's very quick. She gets around it much better than me'.

Generally though, in terms of accessing devices, Lottie understands the boundaries set by her parents. She doesn't know the password for the iPad for example, so asks for help when she needs it. She also frequently checks with her mum during the course of our conversation for permission to do things. Use of dad's devices is generally not allowed, and although the girls do sometimes see him playing games "they've never asked to do anything like that". On the iPad Lottie tells me 'my dad has his own file, here ... I'm only allowed to play *Angry Birds* on it'. The laptop and iPad are shared devices, and each member of the family has their own personalised area. On the laptop Lottie has her own folder of documents (on the desktop) and on the iPad there is a folder of games/apps for her and her sister ("and my dad has his own folder here").

When I ask about photos she quickly navigates to a number of Christmas videos. This is in contrast to the difficulties I observed her encountering when managing and navigating data on her school screen and raises potentially interesting questions about their respective visualisation of navigation and personal space to which I will return.

In terms of the content on the devices, mum is the gatekeeper here as well. She has downloaded everything on the phone or iPad either in response to a request or because she has decided it would be a good idea. She reports that Lottie 'wouldn't know what the App Store was, or that she could go and look for an app', a statement supported by Lottie who tells me she 'wanted to do some Maths so mummy found some'. On the laptop Lottie has more free rein, however, her engagement still seems influenced by her mum at a distance. At one point she finds herself on a page where 'free games' are advertised at the bottom and she self-regulates: "So this one is a free game – that I don't want of course". Here too it seems that Lottie understands and respects the boundaries that her mum has placed around her use. This has perhaps emerged through co-use as she and her mum also use the computer together, either deliberately when mum helps her with research, or opportunistically to look things up:

> Mum: 'We always Google it. So if she asks me what is the most numerous animal on the planet, she didn't phrase it like that, I can't remember how she phrased it, so we had to Google that so you know
> Me: And would you do that on your phone?
> Mum: I think I did, I think I did actually – it was actually at bedtime, it was actually in bed, it was like a little 'night, night Lottie' and I had my phone in my pocket so I had a quick look to put her mind at rest before she went to sleep

This kind of everyday life information seeking (Savolainen, 1995) is part of the **social and emotional** fabric of family life, for example both mum and Lottie look up ideas for birthday cakes. Mum reports that Lottie will 'use Google Images and then choose ones that I clearly can't do and I'll be like 'OK [laughs] It'll be something like that Lottie yeh'. Similarly Lottie reports that some of the previous searches on Google images are for a monkey cake that mum is making for a friend. Mum is also a moderate Facebook user and has shown

Lottie pictures when they relate to friends and family: "they will sometimes say 'oh that's so-and-so's mummy' so they will, they'll see me using that". Lottie's perspective of her mum's use is that she "just writes like messages and lots of things and she'll probably use it for like … photos".

The most prevalent **value** driving family practices seems to be an emphasis on family connectedness. Lottie's younger sister is also ever-present. Mum describes them as being 'a little unit' and Lottie tells me her sister is always on the sofa or next to her when she is doing things. From Lottie's perspective she is not 'teaching' her sister anything, she either just watches or she already knows everything. In terms of entertainment Lottie tells me they sometimes watch a family film and when they do they 'kind of all decide together'. They had recently watched *Paddington* and *Boxtrolls*. Also on the iPad app *Monster Maths* mum and dad as well as Lottie had profiles, indicating that they had also had a go at the game. In this sense device use fits in with the wider picture of a family that places great value on togetherness in other aspects of life: "going to their allotment, camping, getting muddy on family walks". This emphasis on outdoor activity also shows that they are a family that seeks balance. Mum laughingly refers to herself as 'Luddite' when she tells me of an occasion she got really annoyed because some friends took an iPad on a camping trip. However, she also recognises that her own behaviour has been changed by device ownership and is self-reflective about the difficulty of modelling good practice and balance:

> Mum: I really really try consciously not to do things like that but it's more like, this is going to sound awful but I'll be looking on my phone while I'm in the kitchen cooking their dinner and they're in the other room and then they'll walk in and I'll be doing it and it's just awful … I don't want to pass that on and I don't even want to be doing it myself it's terrible

In terms of any **pedagogical** interactions these seem to be spontaneous and requested by Lottie rather than planned by mum. Lottie tells me that when she's using the laptop or iPad 'mummy's always in the kitchen' indicating that she is doing it independently but within earshot of her mum. During our conversation, when the iPad freezes she calls out to mum to help her understand why. This is in contrast to school, where when things don't work she is more inclined to

improvise or ask her friends. Although she clearly respects her teacher (and her authority – 'if teacher says I am allowed') she doesn't see her as being able to help, unlike her mum.

However, it is clear that as well as doing things with her mum, Lottie likes to be independent. When we reach the end of the interview and her mum tries to help her save her work, I hear her whispering "Yes I know how to do it" and her mum also reports that the first time she was given proper homework: "it was interesting. Cos she did it with [her granddad] … But he said to be honest she just did it all".

Overall therefore Lottie's engagement seems to be shaped by mostly conscious choices about the presence of devices in family life driven by values of emotional warmth and family connectedness, but without being overly controlling.

Emergent understanding and reflection

There were moments during my conversations with Lottie when she showed reflection about what she was doing or reporting. For example, she told me that she chooses not to play with friend because it would lead to arguments over turn taking "because say I had more goes than Cara she would say 'hey you had more goes than me, that's not fair'". When she is giving me a tour of her laptop and she sees 'Free games' she pauses:

> Me: If you found something like that would you be allowed to play it or would you
> have to ask mum first?
> Lottie: Maybe if it was a good game yes, but only if it was app-ro-priate [using an
> exaggerated tone of voice]

Insofar as it is possible to characterise the ways in which Lottie understands and is reflective about the nature of connected device there is more evidence of her functional abilities. She uses shortcuts telling me 'I go on Google Chrome, which is what I normally go on to look up something' or 'I just went on 'frequently visited'. On one occasion she types 'RoaldDahl.com games' in for one of her searches. Beyond this she doesn't have a rationale for why she

chooses particular sites: "I'm not sure, I don't remember, the last time I went on this … oh my mum's got that" or "well I just looked around a bit and then I saw and that's how I got the work." Her mum tells me too that Lottie struggles with really understanding the nature of the online landscape:

> Mum: So the other thing they did was the Great Fire of London and she was obsessed with finding out how many animals died. And she just couldn't find a figure and she was like … I think that's it, she expects every answer to every question to be there and she just kept going round and round in circles just not really finding it

Although the majority of devices that Lottie uses are effectively 'online' much of what she does is not and it is not clear whether Lottie is aware of when she is online and when she is not. The language she uses and understands suggests that she does not have the tools to conceptualise how the online world works. She talks of going 'online' and 'on Google' but when I ask what Safari is she tells me 'it's Google' and she isn't able to put into words the difference between an app and a website or what the internet is. According to her mum:

> I don't think she separates it all. She knows what *Google* is, she knows to Google something and find it on there, but I'm not sure she's really figured out, she definitely hasn't figured out all the different sites. I mean actually one of the biggest things we did, she wanted to learn about Roald Dahl, so I actually got my laptop out for that because she wanted to make a poster and so she *actually had several windows open* [my italics] and so I think she was kind of understanding that there were different things on the internet … I think she was … But that's the first time we've ever had that. I think she just *sees it* [my italics] as one big thing

Returning to the school network, it could be argued that this itself is potentially a good first stepping stone to develop an understanding of the 'connectedness' of the online world. However, in this classroom screens are seen as intermediaries to other forms of communication rather than portals in their own right. Not only do the screens Lottie engages with at school offer fewer multi-modal/multi-sensory affordances than those at home, the screen is predominantly a tool to

make a print-out, as was indicated by the tray of work Lottie showed me at the end of term and the fact Lottie mentioned several times that she had 'printed it out' or 'put them in our trays'. When I ask if mum and dad get to see what she has done on the computer she tells me she is taking a print-out home: 'I have a photocopy of it so it doesn't matter'. In addition, when children want to work together they have to work on the same computer rather than working collectively on a shared object. Rather than presenting the connectivity of the school network as a positive affordance, in these instances it serves to confuse the children and as a missed opportunity to start exploring and clarifying how connection works.

School 2

I will draw out the main themes of the above portraits at the end of this chapter, but first there was one more child who attended a different school close to School 1 but very different in character. I have explained this imbalance in numbers in my Methodology chapter. Nonetheless Tom and his classroom provide an interesting complement to these portraits.

School 2 is situated just over a mile away from School 1. It is also is a larger than average, Ofsted 'Outstanding' primary in where the majority of children are of White British heritage. However, the school is situated in an area of high socio-economic deprivation and here the number supported by the Pupil Premium is well above the national average.

This school has more advanced systems in place for the teaching of computing and internet safety. Although it does not have a VLE, the website has links to class blogs which are maintained by teachers and where photos and descriptions of class work are uploaded as a communication channel with parents. All students and parents have signed Acceptable Use Policies, outlining expectations when working on computers.

The Year 2 teacher whose class I observed in, is also Computing 'Mentor' meaning she is responsible for strategic planning across the school in terms of Computing curriculum along with the ICT technician. He also runs Code Club

and Bright Sparks, a computing extension club for Gifted and Talented students from all year groups (bar Foundation). Recently, the Year 2 teacher attended a one day 'Head of ICT' course on implementing the new National Curriculum for Computing. At present the school uses a commercially produced scheme of work. The Year 2 class has two scheduled lessons of ICT per week across the entire school year. One of these lessons is more specifically computing oriented, the other links with literacy or maths. Occasionally the class also uses iPads or laptops for research purposes as part of topic work. In the second half of the summer term the students use their ICT skills as part of a project – last year they designed and advertised their own games for others to play. At the beginning of the year, before they do any ICT there is a big block of e-safety teaching and teacher told me that whenever they do any online activity – e.g. research – there is always reinforcement of key rules. I observed this to be the case over the course of my study.

There are no computers in the classroom itself. When they need to use them they either go to a dedicated ICT suite adjacent to the library or borrow iPads (kept in technician's office). In this room there were enough computers for one each although work almost always took place in pairs and the room could become very noisy when all this joint work was going on. For these lessons passwords were always given out on small pieces of paper at the beginning and collected in at the end.

For Safer Internet Day they had two days of activities. The teacher and a technician delivered a presentation for parents – only two attended. However, they had also created a walk-in information area in the atrium where there were laptops set up with online safety games and leaflets to take away. Several parents and children took up this opportunity. There were still posters for this event at the time of my visit. Outside the ICT area there was also a board with an e-safety related question (from Safer Internet Day – How can we create a better internet?) with a whiteboard for children to write suggestions – which they had done. Over the course of these two days there were also assemblies for KS1 and KS2 (customised versions of the SID materials made more relevant to children here) and the theme of online safety was embedded across all

teaching for those two days. At the end, Year 2 produced posters for other children highlighting key aspects of e-safety.

The school subscribes to Purple Mash, a commercial educational software and Infant Encyclopedia. They also sometimes used a designated children's search engine – KidRex – which was framed as 'super safe'. Occasionally computers were slow or didn't work but this was not the norm. Generally the network functioned and the infrastructure was repeatedly explained to the children. This was supported by the teaching assistant:

> In the background I hear a TA saying: We're going to save it first of all, which sounds a bit daft but if we do that then at the end all we have to do is click on this. So if we save it and give it a name

> Extract from field notes, June 11th 2015

In terms of actual boundaries to the classroom the internet was filtered and in theory blocked inappropriate content. On several occasions I saw content being blocked. However, the boundaries were more porous when it came to the knowledge that children brought from outside the classroom. In the circle time/snack time that often followed on from ICT lessons, there was often some general discussion about computer use. These class conversations revealed some of the children's home practices. For example, some children were using platforms like *Movie Star Planet* to communicate between each other. In classroom chatter therefore there was an awareness of a range of content – both age appropriate and not. The main buzz at the time (here and elsewhere) surrounded the game *Five Nights at Freddie's*. From what the children said, it was clear that parents used a range of mediation strategies: one child had quite clear understanding of e-safety, others talked of accessing age-inappropriate material seemingly with parental knowledge. To some extent these parental mediation strategies also shaped the classroom environment. The practices and knowledge brought in to classroom culture conversation emerged as a potentially strong influence on children

The teacher was responsive to what she learnt from talking with the children. On the one hand, she had followed up on the conversation about *Five Nights at*

Freddie's by looking the game up and then speaking to parents. On the other, she had recently experimented with introducing *Minecraft* into the classroom, although unfortunately the school server could not cope with the number of people playing so the idea was abandoned.

In this classroom a diverse range of ICT activities took place over a range of different platforms. Over the course of the eight lessons I observed the class did research on the Seattle Space Needle, made a quiz about nocturnal animals, did some basic coding to create a game, used Kid Rex and the Infant Encyclopedia, learnt how to copy and paste images, practiced typing with a dance mat and played on *Mathletics*.

Between February and June 2015 I visited this Year 2 classroom eight times, on each occasion spending approximately an hour. I recorded video and audio material, took photos and made field notes. On one further occasion I conducted a research conversation with Tom and three of his classmates.

Tom

School portrait

Tom's classroom afforded him a wide repertoire of practices and over the course of my visits I saw him using a range of modes for different purposes. Because in this classroom computer activities were more structured it was clearer that at times he was 'on task', at others he was operating 'under the radar'. The most obvious example of this was Tom's engagement with the Maths platform *Mathletics*.

Although the primary function of this programme is for children to practice specific Maths skills, it also has subsidiary affordances. For example, there is the capacity to earn credits in order to create and customise avatars and to compete in a multi-player environment. Despite use of these features being banned in the classroom, Tom was able on more than one occasion to spend almost the entire session engaged in them, either because of their positioning

on the screen or because of his teacher's impression of him as competent. On one occasion Tom spent the entire session customising his *Mathletics* avatar. On another I noted that he appeared to just be looking at the same Maths question for ages but in fact he was fiddling with pictures on the left hand side of the screen – changing them for different icons.

Later I captured the following exchange:

> Boy: Tom look at my guy. Look at my guy.
>
> Tom: Come and look at this. I clicked on this [pictures on left hand side of screen] Favourite food: oil.
>
> Boy: Do you want to see his favourite food quickly?
>
> Tom: [Gets up and shows him] Go on that 'favourite food'
>
> Boy: Lemon … what's your age of him? What's his age?
>
> Tom: [Looks at left hand of screen] Two years
>
> Boy: My age is 14. What's his favourite sport?
>
> Tom: What's his favourite sport?
>
> Boy: Soccer. That's his favourite sport. What's his?
>
> Tom: I don't have it
>
> Boy: There [points]
>
> Tom: I could change it [goes back to scrolling through characters]
>
> Boy: I'm going to change mine … I'm changing mine to bees
>
> Tom: I'm changing it to the dog
>
> Boy: Look at the bee … it says 'weapon - laser beam'
>
> Tom: Look at this then. He's called Digit. What's his favourite game? His favourite game is Fetch
>
> Boy: Woah. It's a laser. It's a laser
>
> Tom: Yeh it's a laser beam
>
> Boy: Go onto the bees … seriously
>
> Tom: I know [scrolling through – chooses knight] The knight.
>
> Boy: Ah he's so cute
>
> Tom: I'm going to see what's on the knight … He's got like a scroll [knight starts walking]
>
> Boy: On mine he's 85 on mine
>
> Tom: [scrolling through more] OK OK [chooses bear] See what bear is … oh
>
> Boy: Again another scroll [chooses another figure – a man – and goes back to maths activity]

Tom's classroom practices could be characterised as exploratory tinkering and sometimes boundary testing. He would literally go to the margins of the screen

in search of the 'funnest' opportunity available to him at the time. Sometimes this led to him doing something that coincided with what 'counted' for the teacher and sometimes it did not. It is interesting to consider how educational software packages like *Mathletics* and Purple Mash are embedded into classroom practice and the way they shape children's engagement. Looking at it from Tom's perspective, the sanctioned activity of going through an online Maths quiz was of little interest, except when it was incentivised by the winning of credits to buy sunglasses for his avatar. Rather he was drawn to features that were 'banned' in the classroom like the multi-player competition or peripheral to the actual activity, like the episode above. In the search for where there might be opportunities for encouraging and supporting reflective engagement this raises interesting questions about 'proper' use in contrast to actual use that merit closer attention.

Family portrait

The family live in a more economically disadvantaged area than the others, in a small three-bedroom house. There are five children currently living at home, a 19 year old who has been away to university but come back, and four children aged 7 and under (two boys and two girls), who all share a bedroom. Dad is a bus driver and mum does not work. She is currently doing free Maths and English courses via Learn Direct in order to improve her GCSE grades.

Tablets are the latest in a line of games playing (technological) devices that the family has owned. When I ask what was life like when they were bringing up their eldest son ten years ago, mum tells me:

> Mum: There was Playstation 1. I didn't have a smartphone I just had a phone. I didn't have an internet telly I had a big backed telly [laughs].

The reason for having games-playing devices was as much for the parents:

> Mum: Bionicle. I absolutely loved that game. [Eldest son] had that when he was growing up and it was me that used to play that game. I completed the whole thing. I was like 'yeh I've done it!'

Although mum also suggests that not wanting Tom to suffer from peer pressure is another reason for getting things:

> Mum: They're all up school talking about *Minecraft* and if one of them goes in and says 'what's *Minecraft*? I don't know' 'Ha ha you haven't got it' you know. Different as the ages go on. I mean bullying does happen. Now it's technology whereas before it was over a pair of battered shoes you know.

Mum and dad both have smartphones, which they use for games and social media as well as texting and reading e-books. Mum also uses Facebook, primarily as a platform for games, although she also sometimes posts photos. However she is aware that 'it gets people in trouble' and prefers not to get too involved.

Devices obviously play a central role in Tom's life. His mum reports that he goes on his tablet first thing in the morning and as soon as he gets in from school and that he finds it difficult to tear himself away for tea, often getting distracted and rushing through to get back to it.

> Mum: First thing he does is he'll come in and he'll take his coat off, and his book bag and shoes and hang them up out of the way and then he's looking for his tablet. Or he'll say can I play with the Playstation. If I say 'no', 'where's my tablet?' Or he'll want to go on the computer, and he'll want to play …

In terms of other activities, he has a bike and a scooter and he likes playing football but "gets bored very, very easily. If you're not out there with him, he'll want to come in". The park is on the other side of a busy main road and with three younger siblings mum finds it logistically difficult to manage taking all of them out. However she is also wary of letting him go and play with friends if she can't see him. Instead he is allowed to play on the small stretch of path outside his front door. Indoors he has toys but he "very very rarely plays with them", he's not interested in Lego and although he plays with his younger sisters they can't often agree on something they all want to do.

Like the twins, he has his own tablet (although unlike them he also has access to a PlayStation, a Wii and an Xbox) and he treats it as a precious personal possession. He regularly customises the screen:

Mum: He likes to take lots of pictures, he knows how to set his homescreen and his what do they call it where it goes … time out screen … he's set that to two different pictures.

This can either be with pictures of things he likes, such as cars, or with home photos:

Mum: He got me yesterday to take a picture of him and the girls cos J wouldn't sit there and I said to him "there you go I've taken a few, pick the one you want" and he set that as his home screen.

Although he is a very keen game player, when I first arrived Tom was most eager to show me the functionality of the tablet. He starts by telling me he has created his own lock 'so no-one can like get in':

Tom: I use 'Settings'. This is how I got my lock. I went on 'Lock screen' .. 'Screen lock' and then I got a pattern and it's that
Me: Oh that's good isn't it? So you don't even have to type in a word. You just make a pattern do you?
Tom: Yeh. Or … I could do a pin [gets up pin screen] But it only lets me do 12345 or it might let me do 88890
Me: Have you talked about passwords at school? Cos you have quite a lot at school don't you?
Tom: Yeh
Me: What do they say about why passwords are good?
Tom: I don't know [He is fiddling about with different numbers]

After this he starts going through various icons seemingly for the first time and seeing what they do whilst talking authoritatively about it:

Tom: I use 'Contacts' [clicks on it]
Me: What's contacts?
Tom: I can just like call people
Me: So who would you call?
Tom: I'd call daddy [only he and daddy are in contacts] but my big brother …
Me: OK do you sometimes just use it like a phone if you want to ring your dad or ..?
Tom: Yeh [Gets up keyboard] I can search people in but … I can type my … this is my big brother's words .. his phone number [types name and word 'orange' into search bar] 'Benny orange' ['No contacts found']

Me: Oh

[Tries again typing name and a mobile number]

Mum: What are you doing?

Tom: Showing her 'contacts'. What's Benny's um …

Mum: How do you get that?

Tom: Easy. I just do the contacts … What's Benny's phone number?

Mum: I don't know. Why?

Tom: I want to know

Mum: Why do you need to know? You can't ring him

Tom: I could

Mum: You can't

Tom: Why?

Mum: Cos you haven't got a phone

Tom: I can just ring him on this

[Mum takes tablet and looks at it]

This episode highlights some of the key features that defined Tom's engagement: the ambiguous balance of understanding between Tom and his mum, the pushing of boundaries, and the perception of devices as an emerging part of his personal identity.

Tom's practices

From what Tom and his parents tell me, his home practices can primarily be characterised as either playing games or watching vloggers on YouTube (he subscribes to various channels such as Dan TDM, Stampy, Smosh and Ballistic Squid), although he also has some interest in listening to music (he has one album on his tablet that his dad downloaded for him when he asked). Some of the games he plays are similar to those of others in the study – *Minecraft,* Lego games*, Minion Rush, Crossy Road*.

However, in the classroom it is clear he is also interested in visual play and creative functions. Unlike at home where mum told me he had a drawing app but quickly got bored of it, I observe several occasions where his curiosity about on-screen affordances leads to visual play. Sometimes this could be as a way of doing something more fun to avoid the actual task. For example, in one lesson they are supposed to be creating a quiz in Purple Mash but he spends it using a drawing function to create different animals. At other times, this visual

play actually builds on and improves the original task set by the teacher. In one lesson, where the teacher is trying to guide them into copying and pasting images into PowerPoint, Tom and his partner instead work together with initiative and creativity to use the functionality of PowerPoint itself to get images on screen:

Tom starts to use shapes – finds a circle and makes it bigger

Rachel comes back

Rachel: What are you doing?

Tom: I'm doing a person

Rachel: Are you using shapes?

Another girl: I know where you can get the pictures

Tom adds a line

Rachel: I've got an idea [takes over the mouse] She finds something else on the menu

Tom gasps

Rachel: I was just having a look

Rachel: Shape outline

Tom: I want to do an eye

They keep trying but can't quite get it right

Rachel: Oh genie will know

Tom suddenly grabs mouse

Tom: Wait a minute wait a minute I've got it

Rachel: Not that one it's an arrow … but you can have a different one there, there

Tom follows what she says.

[Although the classroom is noisy the two of them are really focused]

Tom: [Turns to me] I don't know how to do eyes

Rachel takes over for a bit

Tom: How is that going to work?

Rachel: We can get rid of this and put it to the side

Rachel points at the screen Tom moves something. They have managed to get a face now

[In background teacher says 'It's a real problem-solving session this one]

Rachel: How do we get colour?

Tom: [To teacher] We just found lines in 'background'. We got it we got it Miss we got it

In terms of what motivates Tom, opportunities for multi-modal engagement are always more appealing, and usually more productive. During my home visit I

ask if he ever looks things up online for school and he instantly clicks on the microphone icon on Google:

> Tom: [Speaking to computer] What is the fastest train in the world?
> Me: Oh you don't even have to type it in?
> Google: [The computer is reading out the text in the Google snippet] Maglev. According to railway technology Maglev also know as Shanghai Trans-Rapide is currently the fastest train in the world.
> Me: So who showed you how to do that with the talking into Google?
> Tom: No-one I just saw the um this thing [microphone icon] I pressed it and it came up with this

Although I observe more than one lesson where the children are taught to type and, on one occasion, to type full questions with question marks into search engines, Tom always finds an alternative option. For example, when navigating the Infant Encyclopaedia for information about spring he first chooses to click on the 'Remembrance' category "Cos it's a flower [picture of a poppy]" Later he spots a microphone icon. Although at first he and his partner are not sure of how to make it work they persevere. Eventually they work out how to get sound and subsequently take turns and share information for the rest of the lesson. This was the most productive lesson I observe in terms of information gathering because they are focused. On another occasion when looking for information about the space needle on Wikipedia he is first drawn to a graphic on the side of the screen and secondly to the 'Talk' button, which he mistakenly perceives to be a way of asking Wikipedia a question.

The main things to emerge from across Tom's home and school use are that he is very motivated by devices and he is keen to explore the functionality of them for himself by "messing around", sometimes in the pursuit of pushing boundaries, sometimes to amuse himself or others. He is comfortable with a range of multi-modal literacy practices and there are some signs that his relationship with devices involves aspects of emergent identity play.

Aspects of context

At a **material** level the defining feature of this household was its abundance of technology. This raised a number of challenges in terms of managing

boundaries and creating safe spaces that were suitable for all the children. In the house screens are both highly visible and highly audible. On the main wall when you walk in is a large, flat-screen internet/smart TV. On the shelves on either side are a desktop computer and tablets, an Xbox, a Wii and a Playstation. On both my visits the television screen was switched on, even when it was not being used. On the occasion of my first visit to observe the children, over the course of an hour and a half, the children moved between different devices, sometimes playing together and at times each using a different device. The volume levels on each device are all at normal level meaning that for a majority of the time there are competing soundtracks: *Minecraft* music, 'Let It Go', Now That's What I Call Music, nursery rhymes and so on. In addition, during my visit there are frequent pings from smartphones, suggesting text, Facebook or email alerts. This is presented as being normal:

> Dad: Well now they've got two tellies in there [bedroom], so the girls can watch what they want to watch and the boys can watch what they want to watch
> Me: Do they have to wear headphones?
> Mum: Oh no, no it's just very noisy

Some of the devices are connected to each other – so it is possible to play on the Xbox via the TV or to stream photos from the computer. This can result in family togetherness:

> Mum: We've got umpteen pictures of them on the computer and it can be streamed to the telly and they'll sit and watch that, not a problem, or they'll sit and watch when it goes through on these slide shows on the computer. They love it. Who's that? Who's that? Look it's me! They all like that.

On other occasions it is problematic. For example in terms of interference or exposing the younger children to things:

> Mum: Tom knows that he can link his tablet to the telly and watch it through the telly
> Me: How does he do that?
> Mum: There's a little button, not a button an icon on the screen and it says "share" cos it's an internet thing … Brilliant or not depending on what he's watching.

With this many devices in use, it is obviously difficult for Tom's parents both to know who is doing what at any moment and to keep track of the content the children are accessing. This is exacerbated because they are allowing even the younger girls to watch YouTube unsupervised:

> Dad: For ages she was going on about this Piggy in the Buggy thing, couldn't work out what it was, so we typed in 'piggy in buggy' in the search bar, couldn't find it. What it was it was this cartoon, Russian cartoon, it's on TV now
>
> Mum: Meow Meow or something
>
> Dad: It's about a girl and a bear. Eventually she would just throw the tablet and say 'piggy in buggy' 'What you talking about?'
>
> Me: So they've found stuff and you don't even know what it is?
>
> Dad: No

Increasingly mum and dad are concerned about the quality of content that Tom is accessing – primarily in terms of bad language and behaviour: The examples they give me are *Five Nights at Freddies, Grand Theft Auto, Happy Wheels and Smosh*. Dad shows me the latter to make his point:

> [Smosh vlogger] Boring butt – it's the most boring Evie video I've ever done. She's so crap today, what's up are you sick? You need someone to rub your belly? It's not going to be me. Cos I hate you!! Want to get a drink?'

Primarily this is content that Tom finds and downloads himself. Sometimes these are things he has been introduced to by his older cousin; sometimes he follows suggestions from vloggers who he appears to look up to:

> Mum: Happy Wheels. Now I don't like that game. I don't know where it's come from, I think it's this Smosh thing, but it's basically about this bike, you push this bike thing, and if he gets hurt you see the blood, it's not nice

It is clear that he is also exposed to advertising on these sites. When his dad shows me an example of the stuff Tom accesses we wait while an advert plays:

> Me: Is that the games site?
>
> Dad: No that's just a trailer, I'll show you in a minute…
>
> Me: So would that trailer come up when he's looking for the game then?
>
> Dad: Possibly

> Mum: Yes. Is it the PEGI 18 where they're fighting? Oh no, yesterday it was 'Call of Duty' on there. It looks like it's different ones.

In terms of any **pedagogical** mediation or discussion about use, Tom's parents have tried to have conversations with him, for example about inappropriate content, but they do not find him receptive to this:

> Mum: I have found with him that the more and more I go on about this Smosh and it not being appropriate, the more he wants to watch it so I've kind of figured if I sit back he'll get bored. I hope

In order to try and set boundaries and create more managed spaces for the children Tom's parents instead use a combination of technical means, restrictive mediation and monitoring. Of all the parents in the study they are the ones to have installed the most parental controls on their devices. However, here too they are faced with needing to do things in multiple ways:

> Mum: We've got Virgin. I can access the parental controls and block them from going on YouTube at all on the computer. I don't know if it would work with the WiFi though. And if I did it it would probably block everyone. All the adults and everything … He's got a Safety Mode on his tablet as well, and yeh granted you just push the top of the screen cos it's a Samsung and they're easy to use, but he'll take that off, so I thought right, I'll go one better and put this Safety Mode on YouTube and I spent a bit of time looking at how to do it … just took it off. And there's no way to put in a password that he can't take it off. Yeh we've got parental controls on our computer
> G: And have you got them on your iPhones and things?
> M: With Google Play you actually have to enter your password so you can't download any apps you've got to pay for in case he gets stroppy about that

The shaping of spaces using these means is presented as being a battle with Tom. Whilst he has a keen sense of wanting to keep his own device private he will push the boundaries regarding others:

> Me: is he allowed to use your phones
> Mum: Not really, but he does
> Dad: You can't just put them on the side
> Dad: We've tried putting passwords on there, he needs to look at a password once and he can undo it

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Dad: I've got an iPad over there, I put my password in it, its my work number, the only people who know it is me and [his mum], and it's **** and I put it in once, he saw it, bang, straight in

At times therefore they have resorted to other physical means to restrict his use:

Mum: We take the tablets away but he'll climb …
Dad: We've hidden then under the sofas, we've hidden them in the bedrooms
…
Mum: We've even tried leaving it dead so he doesn't do it and he'll plug it in
Me: So normally is it you who charges it up?
Mum: No it's him .. and if it's dying it'll beep and he'll sit here and plug it in to play it

With the amount of device play that is happening in this household **social** dynamics also play a part in how engagement is shaped. When the children play together on a device this raises the potential for arguments, for example in *Minecraft*:

Dad: [Younger brother] does one thing and Tom does another thing and they don't work together … if they worked together they could complete the game, but because [younger brother] is jumping around throwing Tom's carrots here, there and everywhere, Tom gets stressed, starts throwing controls on the floor and starts kicking and punching him ..
Mum: I have resorted to putting one upstairs on a Playstation and one down here but the girls then get fed up cos they've not got no telly and they do like to watch their [programmes] …

In terms of co-use with parents, although the potential is there for joint game playing this seems to be restricted primarily to the children getting their parents to help them crack particular levels rather than sharing the fun of playing together:

Mum: They go on to his {dad's} saved icon and play his game rather than starting their own because he's that much further.
Me: OK so they like the fact that he can do it. But would they ever say 'dad can you show me how to do this'
Mum: Yes Tom will. 'Daddy I can't do this. Can you help me please' or 'Mum I can't do this can you help me please' I'm like really? Cos he'll ask me at tea time

Me: So they do want you to join in a bit. Mostly so they can get better or because they want the fun of playing with you?

Mum: Mostly so they can pass whatever level it is they're on .. cos as soon as it's done they want their remote back … immediately

Mum also acknowledges that some of Tom's practices come from watching her own use:

Mum: I suppose he has said to me in the past "what's that" and I've said "oh its just Facebook" not thinking anything of it. And then all of a sudden he's interested ... He does like to play a farming game that I've got on there. I don't play it any more but he likes to go and do like harvesting crops and …I don't have any fighting games on there as such it's mainly puzzle games

This indirect observation has led to Tom developing certain practices:

Mum: He can upload pictures to Facebook, mine or dad's. He can do that and he can type in whatever he wants to put with that picture

Me: When you say he can do you mean he knows how to or you let him?

Mum: I can't say I let him, he just does it. If he has my phone he'll take a picture of his work, what he's drawn or whatever and then he'll put that up. Or he'll take a picture of something he finds funny and upload that

Me: So you wouldn't stop him putting things on your Facebook?

Mum: No cos he just .. he takes pictures of what he's done, his artwork …

Although at home Tom's engagement is shaped in large part by the social dynamics of his family, his engagement itself is more personal and private. In contrast, in the classroom Tom seems more sociable, perhaps because the classroom culture of peer support positions him as someone able to both participate and help others. He is motivated by the fact that he is 'good at computers' and perceived as such:

Girl asks Tom: Where's it gone? I can't find it

Boy: Tom, mine doesn't work

Tom: Wait a minute, I've just got to sort out [name]

Tom: [Leans over] Do you want me to make it greyer? I know how to do that …

Do you want me to get rid of that grey dot?

In the classroom, much more than at home, Tom perceives the screen as a medium for social activity, with his peers as collaborators, competitors or

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audience. The fact that he is perceived as competent also means that at times he can operate under the radar and the teacher will assume he is getting on with things. In one lesson he uses the online multiplayer function of Live *Mathletics* to compete against his classmates:

> Tom: Right join me in after I've got logged on
>
> Me: What's 'Live *Mathletics'*?
>
> Tom: It's a thing where you do like Maths and you try to find ..
>
> Charlie: Let's find Tom
>
> Toby: Look at [name] [referring to avatar?] He looks like a cowboy
>
> Tom: What does he actually?
>
> Tom: Right I'm going on there right now … I'll try and find you .. Charlie look on my screen
>
> Charlie: Tom you're ready
>
> Tom: I know
>
> Charlie: Go to the top I'll be at the top
>
> Toby: I clicked ready
>
> Tom: Ben looks like an old grandpa
>
> Toby: I'm ready
>
> Me: If you're on 'Live *Mathletics'* does that mean you're playing against each other?
>
> Charlie: Yeh
>
> Tom: We're going together … Have you joined me in?
>
> Charlie: Yeh that means you've got to join me in and press go
>
> Tom: Right me and Toby's on

When the teacher spots them doing this they are reminded that this is not allowed in class. After this Tom's progress through the Maths exercises slows down. These two episodes with *Mathletics* raised some interesting questions for me to which I will return in the Discussion.

Just as at home he frequently works things out by trial and error and playing with different buttons, rather than listening to the teacher. Several times he talks of finding 'a different way' of doing something, for example navigating to a programme on the school network even shortly after the teacher has walked them through the 'proper' way of doing it. In addition, my field notes capture him working out shortcuts for how to do things (e.g. change the background colour in PowerPoint) half way through another child showing him. It often appears therefore that his practices and perceptions are being shaped in direct relation

with the screen itself. The thing that most characterises Tom's practices in the classroom is opportunism: he is always looking for something on screen that is "fun" or "cool":

> Tom types 'police lamborghini' in to the search bar at top of the page. Clicks on 'images of police car lamborghini'
> Tom: Ooh I've seen one pretty good. There
> Copies one, goes back to *PowerPoint* and pastes Gets another one and moves it next to the first
> Tom: I want to find a really good one

By following links and suggestions and clicking on icons this can lead to practice that is inappropriate in content or context. As this lesson developed I observed a child suggesting that they look for police shooting people:

> Tom types 'police shooting'. They then scroll through the images pointing out 'cool' ones
> They are on Bing. At the bottom of the screen is a section that says 'People interested in 'police shooting people' also searched for'
> They go to a new page with the phrase 'real police shooting' in search bar
> At the bottom of the screen now is a section that says 'Explore more searches like Real Police Shooting'
> They copy and paste one of these images in
> In the background I hear the teaching assistant trying to explain to another child that police very rarely shoot guns

In this instance, Tom's practice is shaped in part by the affordances of Bing to make suggestions and by his own natural desire to experiment with clicking on links and icons on screen. It is also shaped by his audience of peers. Although in the background I overhear a teaching assistant trying to provide a moral context to this activity, it is not until Tom's partner intervenes that he changes tack:

> Tom types 'police have guns so they can shoot robbers'
> Rachel changes it: That's not acceptable

Some of Tom's peers appear to have at least appropriated some of the language of good practice.

In this classroom there were more structured lessons using computers and prompting questions In one lesson they are tasked with finding some key facts about the Space Needle in Seattle. Unlike in the lesson where they used the Infant Encyclopaedia, they find it difficult to find/extract information. More than this, Tom is reluctant to engage in any critical reflection:

> Teacher: Rachel said that you found the answer to that question – was it easy or difficult?
>
> Tom: Quite easy
>
> Teacher: Do you know if it was a true fact or not?
>
> Tom: It's true
>
> Teacher: How do you know?
>
> Tom: Because we went on KidRex and we found it
>
> Teacher: Just cos you find it on the internet doesn't mean its true does it
>
> Tom: Don't know
>
> [Notes say that Tom is playing with the mouse, looking at the red light on the bottom]
>
> Teacher: What have you just written?
>
> Tom: I wrote it's 1962 metres tall [1962 is actually the year in which it was built]
>
> Teacher: 1962. Do you think that's a true fact or a made-up fact?
>
> Tom: True fact
>
> Teacher: How would you know?
>
> Tom: Cos it shows us the picture

Emergent understanding and reflection

Much more than in School 1, Tom's classroom context is one where some of the issues of reflective engagement identified in my literature review are openly discussed and questioned. In addition to the specific questions I observed the teacher asking Tom about trustworthiness, I also observed several snack time circle discussions about home use where issues of balance and affective experience were implicit and at the end of computer sessions the children were sometimes asked to reflect on what they had learnt about the benefits and disadvantages of using computers for learning. The one gap, here as everywhere else in this study, was in any kind of visual criticality. Opportunities to debate the value of images as information were overlooked, and on one occasion Tom was told that it was fine to cut and paste images, it was just

words that you couldn't do that with. Nonetheless, it was clear from the classroom culture and some of the ways the children around Tom spoke, that some of the reflective practice encouraged by the teacher was producing moments of thoughtfulness.

However, as far as the educational benefits of using computers in school is concerned, Tom's mum is sceptical:

> Mum: [Talking about youngest daughter at pre-school] Even they have computers! They don't need to use computers they need to play. [Tells me about her GCSE Maths and English classes] That's not on computers it's out of books. Much better

> Mum: If I had my way they wouldn't have any of it. But because that's the way of the world now they have to

Both at home and at school Tom is perceived as having good functional skills. As far as his mum is concerned Tom just seems to work things out for himself, for example by experimenting with icons on screen:

> Mum: No he has learnt that and I thought to myself I wonder where you learnt that from?
> Me: And you don't know
> Mum: No

However, there is a sense that neither Tom nor his parents quite understand the architecture of how things are connected and how this can lead to unintended consequences. For example, Tom once spent £70 on Facebook without realising it and he has inadvertently subscribed mum to quite a lot of spam:

> Mum: On my Google Gmail thing I get a load of rubbish through.
> Me: So how's he done that?
> Mum: So he'll subscribe to something. Cos he can read. *He doesn't realise what it means* [my italics] but it will come through to my email.
> Me: And then does he try and access your email to try and watch it?
> Mum: No
> Me: It's just that he's pressing the button

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Mum: Yeh

As with his subscription to various things via his mum's Gmail account, Tom's understanding of the wider context is limited:

Me: So have you got a YouTube little [icon]. Do you go straight into YouTube?

[He has clicked on something in the top right of the screen that has taken him to a 'Search YouTube' bar]

Tom: No I just have that

[Blue person icon in top left – looks like he has opened an account]

Tom: I don't know how to change my picture though

[On screen it says 'Choose an account']

Me: OK. So have you got your own email?

Tom: No

Me: So when it says **@gmail …?

Mum: He has but he doesn't have access to it

Me: And that was just so he could have his own YouTube ..?

Mum: No so he could download some games on his … Cos you have to have it for the AppStore

Me: Right OK

Mum: Since then they've changed it

[Chooses from a list of subscribed channels on the left]

The fact that Tom doesn't understand the way things are connected may be a reflection of his parents' confusion:

Dad: I mean he wouldn't have anything like Facebook until they're 18, 19, 20 so they're not having anything like that until they're older

Mum: Unless he does it without us knowing, which is entirely possible

Dad: But he can't create his own account anyway which I don't think he can do without an email address

Mum: He has got an email address in order to set up his Google Play but he doesn't know the password

The majority of Tom's practice could be described as a relationship between him and the screen, or on occasions him, his peers and the screen. On his own he is drawn to curating, customising, play and exploration. Both at home and in the classroom the design affordances of the screen play a large part in influencing his perceptions and practices, whether this is the freely accessible

stuff he accesses at home or the sanctioned, commercial educational products he is using in school. It could be argued that Tom's perceptions of connected devices are therefore potentially two-dimensional. He sees things as they are represented on the screen, without necessarily questioning what lies behind. This can lead to a perception that there are no consequences to actions and what seems lacking is a wider contextualising dimension to his use.

Overall thematic summary

When this study began, the first contribution to knowledge I hoped to make was a nuanced characterisation of 7 year olds **practices** with online devices that drew together varied **aspects of context** shaping their engagement. In so doing I thought it might be possible to also **characterise children's emergent understanding and reflection around online engagement.** With these portraits I have tried to address these objectives by describing from the bottom up, the situated realities of children's use. Guided by the model outlined in my literature review, each portrait has provided different insights into the material, socio-emotional, pedagogical and cultural contexts of practices and reflection. In the section that follows I will synthesise some of the interesting issues that arose from across these portraits, as well as some of the limitations of this framework.

RQ1: Characterizing children's practices

The children in this study lived in households where similar activities could be accessed and engaged with on different devices. All but two of the families I visited had a tablet, and these tended to be the device of choice for children. Although some families said they would never have games consoles because they were 'time wasters', they were nonetheless allowing tablets to be used in the same way. All families had a laptop or desktop PC. To some extent these were associated more with schoolwork or research (Ofcom, 2014), and on two occasions they were in fact described as "old school", but this was not always the case. Lottie used her laptop and iPad interchangeably, Tom opportunistically. At least one parent in every family had a smartphone – and these were used for a multiplicity of functions.

Broadly speaking children were playing games, watching and listening, creating, communicating and looking things up, Although to a large extent the choice of devices on which to do these things was decided by what parents made available, children did express preferences, citing privacy, ease of use and optimising the gaming experience as reasons for engaging with particular devices. Even at this age children were prepared to reflect on the implications of choosing different devices for different purposes.

Modes of engagement

In addition to encountering a plurality of devices, children are also presented with an increasing range of modes of use. Touch and talk were prevalent in their engagement with devices. At home children were speaking their passwords into devices and using the microphone icon to ask questions rather than writing them. The expectation that information could be accessed multi-modally was carried over into the school context, for example Tom's attempt to use the "Talk" tab on Wikipedia as a way of asking a question. In particular a significant part of all the children's engagement with devices was visually driven. They were capturing, creating, interpreting and sharing images for the purposes of communicating (emojis, selfies), customising (avatars in *Mathletics*) and playing. Much 'everyday life information seeking' (Savolainen, 1995) involved visual searching (using Google Images). In the classroom too, I noted children trying to deduce information from a picture rather than read the accompanying text (Gardner, 2017).

Pluralities of practice

Some sites and platforms were particularly popular with the children in this study - YouTube, *Minecraft* and PowerPoint - and again the affordances of each left them open to a multiplicity of uses. At the time this study was going on, there were debates in the popular media about whether 'playing *Minecraft'* was bad for children or not. However, such simple descriptions told very little about

the nature of the engagement. It was clear that there was no one fixed way of *Minecraft* being used that was either intrinsically positive or negative. As episodes in individual portraits have shown, Ben experienced *Minecraft* as a collaborative building project with his sister, Luke experienced it as an immersive, exploratory journey into a dangerous imaginary world, Will experienced it as part of a wider identity project – populating his creations with icons celebrating the wider aspects of his online world and Tom experienced it as a battle against his brother. Games sites also functioned for some of the children as opportunities for communication: Ben 'spoke' to his sister within *Minecraft*, Luke was gearing up to speak remotely to friends in *Minecraft* via a locally connected server and Will was regularly talking to his grandparents in online multi-player game *Clash of Clans*.

An interesting comparison can be made here with how the children perceived the 'proper' social networking site Facebook. Although most has seen their parents use it for messaging and photo-sharing, at least two of them saw it primarily as a games platform. As another recent ethnographic study points out "use" is a far-from-straightforward activity (Livingstone & Sefton-Green, 2016). In that work a similar diversity of uses emerged in relation to teenagers' use of YouTube and they make the point that they "gained a more nuanced understanding of how and why they love YouTube than one could get from their parents and teachers who, as they told us, simply thought the kids were wasting their time watching silly videos about people falling off walls and cute kittens" (Livingstone, 2016). In the present study YouTube was also engaged with in a variety of ways. Some children used it as an on-demand service because it was the only place to find certain mainstream television programmes (*My Little Pony*), for some it was part of transmedia play (looking at clips from *Toy Story* or accessing music video mash-ups of *Frozen* and *Minecraft*), others were accessing quite niche material related to their specific interests (live footage of trains), several were learning from walkthroughs and tutorials produced by peer-vloggers (Dan TDM, Stampy) and most had watched some form of 'un-boxing' videos, either Lego or Kinder Eggs (Marsh, 2016).

What all of these findings suggested was that it was hard to categorise practices by platform or genre; games playing might also be a form of social

networking, schoolwork might be enacted as primarily a creative activity, watching a YouTube vlogger might be research. The evolution of devices and practices means there are few fixed or 'proper' uses or modes of use for things.

Peripheral practices

As well as the more specific practices I observed children engaging in, there was also much they did at home, and particularly at school, that could be classed more as transitional or peripheral. Proportionally this took up a large amount of time and appeared to shape their expectations and understanding as much as 'actual' practices. Children were not just playing games: they were finding them, downloading them, storing them in folders. They were not just watching or listening to things: with new routes of access (through Netflix or YouTube for example) they are finding, following recommendations, recording and retrieving programmes and creating their own playlists of music on Spotify. These home practices are in turn creating expectations about how to find stuff at school and there too children are clicking on related links, and following on-screen suggestions. Unlike at home however, where their personal items were relatively easy to find, in School 1, a large proportion of their time was also spent simply navigating the school network or desktop. Some children were also customising their device lives. Ben and Tom both showed me how they had changed the wallpapers on their tablets. This desire to customise carries over in some ways into school. Tom spent a large part of one *Mathletics* session dressing his avatar and Lottie, Ben and Will were all involved in individualising their on-screen presentations. In addition, whatever children had chosen to do, there were also moments when they were presented with unsolicited things: in particular I saw several instances of screens being populated with adverts or interrupted with error messages. In other moments I saw them playing with screen marginalia, like the genie or the *Mathletics* sidebar. It was clear therefore that children are experiencing play as part of a much wider repertoire of transitional or peripheral practices such as navigating, curating, customising and sometimes just idling whilst waiting or messing around with screen ephemera, which for some children like Joe and Tom seemed to hold value in its own right.

One issue that I hadn't anticipated arose from these findings around how reflection was encouraged or inhibited by what children actually saw on screen. On the majority of screens I saw children looking at, the desktop iconography presented children with an undifferentiated landscape. Icons for apps sat alongside icons for internet browsers, meaning the visualisation of boundaries between online and offline was not clear. Although there was familiarity with a few particular icons – YouTube and Google – children were not able to articulate whether these icons took them online or not. When I asked Tom and his friends about a wider selection of screen icons, although there was familiarity, curiosity and a willingness to try and think about what they represented, there was also little understanding of what they were and what they did. Sometimes too the actual language of what was happening on screen sparked interest, as on the occasion when Anna and her friends were faced with an on-screen messages about 'buffering' and engaged in amused chat about it. In School 1 I observed several episodes of confusion about the difference between Google (the search engine) and Google Chrome. Although children sometimes saw visual representations of the fact that various devices they interact with were connected to each other – phones ringing appearing on tablet, apps or games being installed on more than one device – children did not have an understanding of 'the cloud' making this possible. Only rarely was there an example of children having grasped what the visual icons were symbolising; Will's mum told me for example that he did now understand the icon that represented an app being downloaded, but this was as a result of an actual incident where he had previously mistakenly downloaded something at financial expense to his mum. In addition, on the occasions where screens did represent in some way the architecture of connectedness, this was not done in a clear way. The design of School 1's network for example was not child-friendly. Although in School 2, more effort was taken to help children understand the school's data management system, and to introduce the children to more child-friendly interfaces such as KidRex and Infant Encyclopedia, for the most part children were navigating interfaces designed by and for adults. In terms of data management, the visualisations of storage – folders, bookmarks, windows and so on – were metaphors derived from adult office life. On the occasion I observed Anna's mum trying to explain this to her, it was clear that it was hard for her to conceptualise the difference between

these things. Interestingly, this difference in perception between adults and children could also extend to how they saw the keyboard. One time when the teacher asked Tom to use the shift key to write a capital letter he said he usually used that as the 'jump button' in games.

Motivation for practices

I have shown through individual portraits that there were different things motivating individual children's practices. Even across a small sample the level of enthusiasm for online devices varied from child to child. It was not the case that all the children loved devices, or that all the children were 'natives' on them. When I observed them playing, there was a spectrum in terms of their engagement. Will, Luke and Joe became so immersed they stopped talking to me altogether. Tom, Lottie and Ben took me on an exploration, explaining as they went. The most common ground across my own study was that when talking about what they did on devices, all the children except Anna described it as 'playing'. They sought out device use because it was 'fun'. Synthesising from these findings I suggest that in my own study there were three main ways in which this 'playing' was experienced affectively: as social bonding, as exploration and mastery, and as amusement of self or others. Although I had not set out to use existing frameworks to characterise children's engagement, these findings did bear some resemblance to the 'genres of participation' described in the literature review, where is was found that children's use was either friendship or interest driven, and that the nature of their engagement could be characterised as 'hanging out, messing around and geeking out' (Ito et al., 2010).

In terms of **social bonding,** often during practices I observed, the activity 'around the screen' became as important as activity on the screen. Particularly in the classroom, for example, I saw many examples of screen sharing with an audience of peers, where the on-screen play became currency in a wider social practice. I will return to this in the next section. Amongst the higher users, a common driver of engagement was the desire for mastery or to **explore and get better at things**. By spending time on particular activities children improved and gained confidence. Several told me they enjoyed doing things on their

devices because they 'were good at it' or liked being good at it. This was evident in game play, but also in other activities. Will had started making his own *Minecraft* videos and was keen to learn how to make screencasts. It has already been noted that children were motivated by trying to get things to work even when there were problems and would persevere with trying to interpret the multi-modal language of the screen. I observed several occasions where they were not put off by things not working and tried alternative strategies to try and get somewhere. The final main motivation for device use was that children wanted to **amuse themselves or others**. Sometimes they did this by just by playing a fun game, for example Lottie was fond of an app that took photos and worked out the age of a person; sometimes they just enjoyed spending time making things look good, working out what different buttons did, even just scrolling through pages of images looking for 'cool stuff'. Although this could look like Idling with no purpose, in their search for fun and easy ways of doing things they often saw possibilities that adults would never have thought of or simply did not see. Across both schools for example I observed that just as with 'playing *Minecraft'* there was no one version of 'making a PowerPoint': it meant different things to different children. Luke spent a whole session on PowerPoint engaged in 'shape play', Ben devised a Maths quiz using the chart menu to create visually engaging questions, Tom and his friends were told to insert images and instead worked out how to create them using shapes and Clip Art. Often this 'messing around' led to them understanding better than adults how things worked.

RQ2: How aspects of context shape engagement with online devices

When I began I was keen to find a way of capturing a holistic view of children's contexts and applying the different lenses outlined at the end of my literature review seemed a good way of doing that. In practice these were slightly artificial constructs and it was often difficult to distinguish between whether what I had observed was in fact pedagogical, social or material. I will return to this issue at the end of the chapter. First I will synthesise again the interesting issues that emerged from across my findings.

Material

Throughout my portraits I have highlighted how parents were trying to create and maintain safe, managed spaces for their children's use. Looking through a material lens allowed for several insights into the challenges of this. Firstly, there were signs of **boundaries** around device use being harder to define. In some families the environment is very conscious and thought through. Will's house was a celebration of popular culture, Lottie's was a reflection of the family's artistic temperament. In others the incorporation of technology was more subject to the messy dynamics of busy family life. However, talking to parents and observing children's practices, it seemed that across all homes the nature of mobile devices, their small size and portability, was changing the way use is experienced. Unlike more premeditated or chosen activities undertaken with computers or televisions, mobiles in particular lend themselves to small, peripheral acts both by children and by adults. Most parents spoke of opportunism about where device use happens – 'random plug sockets', under the table – and I also saw tablets propped up on trampolines. Sometimes the knowledge of where devices had been used came from unexpected photos and videos found later on them. Parents too are modelling (consciously or not) this opportunism. Most of the children had observed their parents using their phones for "everyday life information seeking" or Facebook checking. Several children had sent text messages themselves, usually on behalf of their mums to their dads, for example in the car. Most phones and some shared iPads were in the kitchen where mums reported checking them while cooking either for social reasons, or to look things up. In addition, two of the mums reported having looked things up for their children at bedtime, suggesting they had their phones with them at this point. The clearer boundaries that were possible around device use when computers were bigger and often in shared spaces are becoming more fluid.

Time boundaries are also a way of defining use and various means were used to control this: *Screen Time* app, kitchen timers, parents keeping an eye on the time. In terms of rules there was common agreement that devices should not be used at mealtimes and all had a cut off point in the evening. One family had 'non-device days'. However, here too the boundaries of use were becoming

more fluid. For example, the plurality of devices in some households meant there was some vagueness around the idea of 'screen time' and whether TV was included (or should be included) or not in this definition. As well as using time limits to control their children's use, many parents were keeping an eye from the side, whilst getting on with something else, usually in order to 'buy time' for domestic chores. The mums in the present study were mostly pragmatic, acknowledging that device time would 'stretch' to accommodate the logistics of family life, in particular the length of time it took to cook a family meal and being honest about the fact that they appreciated things that made parenting easier. However, extending the time children are allowed to play relatively freely on devices, while parents manage other demands, was also seen to bring new challenges in terms of reflective engagement. The fact that they were dipping in and out of observation of their children meant that opportunities for reflection or discussion might occur unexpectedly at random moments, or equally might be missed. This is heightened because in addition to more porous boundaries between online and offline time, there are also porous boundaries between types of content. For example, the way the adverts were embedded into game play was so seamless that the children were not aware they were watching adverts, they just seemed part of the experience. A similar phenomenon of porous boundaries through the use of "related" links on YouTube and other platforms was noted by parents.

One thing that was striking across my findings was the technical complexity of extra demands being placed on parents and teachers in **managing** device use. Will's mum talked about the time consuming job of managing memory capacity and storage space in order to accommodate updated versions of games, the twins' mum spoke of how long it had taken to go through the boys' tablets checking apps when they had discovered a problem and Tom's mum had invested a lot of time trying to cover the multiple parental control options needed to make different devices safe. Several parents were trying to scaffold safe entry into online networks: Will's parents had the confidence to do this themselves but were investing time in research, Joe's family were entering into totally unfamiliar territory and had to rely on a wider network of support from friends. At school, the technical complexity of device management was partially done at a higher or external level. School 2 had a technician, School 1

outsourced its technical support to an external company who came in once a week. Nonetheless, teachers and teaching assistants did find themselves at times dealing with problems they did not necessarily feel equipped for, and on my first visit to School 1 the Headteacher herself got on her knees to try and sort out a problem. These jobs consume time and mental energy and are sometimes compromised by (or compromising of) the logistics of busy family and classroom life.

Computer use was usually more clearly delineated in the classroom than at home. Both schools had designated spaces and times for use. In School 2 this was more structured: the class went to an ICT suite at specific times and lessons were framed around particular tasks often using specific platforms. In School 1 there were fixed computers surrounded by posters on the wall and use was allowed during periods of "independent learning". Until my final visit however, there were no fixed tasks, children were allowed to frame their own. Nonetheless, almost without fail they did this using either Google or Microsoft Office applications. In both classrooms there were times when the materiality of devices caused limitations. School 1 suffered from old, often broken equipment. This shaped engagement in different ways. Technical problems led to problem solving or resignation and giving up, depending on the child: Ben and Lottie rose to challenge of working round problems, Joe and Luke were inhibited. In School 2, the teacher had been keen to use *Minecraft* but the capacity of the school network had meant this had not worked out.

In different ways the provision and management of screen content in each school was also shaping engagement. As the attempt to use *Minecraft* suggests, School 2 presented children with a wider repertoire of content to engage with. This was generally pre-selected and often involved use of commercial, educational platforms designed specifically for children. Whilst freedom within these sites was tolerated, use generally was quite tightly bounded by a central locking system that could shut down computers at any point. In School 1, children were given much more freedom to browse the internet at will and were given no specific direction about how to present their work. However, the choices they made were actually more limited. In addition, the lack of curation of content or basic navigation meant the screen was at

times presenting them with material confusion. For example, there were three separate internet browser icons on the desktops, of which two did not work. In addition, across both schools as at home, the porousness of on screen boundaries was also an important feature. There were several occasions in School 1 when children were presented with on-screen adverts and in both schools I observed moments when clicking on a "related link" took children to content that was both far removed from what they were officially doing and inappropriate for their age. In a different way, even the educational software platforms used to frame children's use in the classroom had porous boundaries between 'proper' learning activities and more marginal fun activities, that Tom in particular took advantage of to explore. Some of these countered what might be seen as the more institutionalised screen, with attempts to customise or personalise it, something that emerged across all children's use as an important element of their engagement. Enabled by the visibility of screens, encouragement of peer-to-peer learning and ethos of allowing free movement this was part of a culture of more social, audience aware practices, to which I will return shortly.

Both at home and at school therefore, **provision, management and boundary setting** around device use all contribute to shaping children's engagement. However, this needs to be seen as a jointly shaped process: adults are taking on complex material jobs to create safe, managed spaces, but through requests, personalisation and exploration, some of which are boundary testing, children are also shaping adult engagement and reflection. And at a wider level the delegation of responsibility for this to external others (commercial providers, technical support) or reliance on external social networks of support invites consideration when thinking about how reflective engagement is shaped. The extent to which the curation and management of screens is open to negotiation and dialogue is something to which I will return in terms of reflective engagement.

Pedagogical

In terms of the ways in which pedagogical aspects of children's home and classroom contexts could be shaping children's engagement I observed

variation both between the two schools and across the families. Firstly between the schools there was a clear difference in that School 2 was actively teaching a scheme of work, whereas School 1 was not. As part of this, functional, cultural and critical skills were scaffolded and encouraged. Every lesson began with a functional recap, for example how to find and use an application, and a clearly defined task. Sometimes within the lesson the teacher would try and encourage some critical reflection, as when she tried to get Tom to reflect on whether he could trust some information he had found. Some lessons concluded with a moment of reflection about what had been easy, difficult, fun or boring about the day's particular use. In addition, the teacher frequently used snack time after the ICT session, when all the children had returned to the classroom and were sat more casually in a circle, to have more general conversations about home use. In these conversations, there was more space for exploring personal experience and feelings. This was building on some PSHE work that the teacher showed me from a previous term. In School 1 it was only at the end of my series of visits that I indirectly observed the results of any overt teaching around computer use and this had been focused on functional skills. Rather it was the strong pedagogical ethos of independent learning that shaped use in this classroom. Although the two schools were very different in terms of the provision of computers and the structured teaching around them, they did share an emphasis on peer support. In both classrooms I observed the teachers using specific strategies to guide children to help each other. It was notable in both classrooms, that all children said they would ask a friend before asking the teacher if they needed help with computers. This was predominantly in terms of functional support, although I also observed one occasion where one of Tom's friends gave him some advice about what was "appropriate". Creating an environment where peer support can flourish is what Plowman would call a distal strategy (2007) and building on this is something to which I will return.

For Tom, school provided the major pedagogical framing for his use, apart from the conversations his mum had tried to have with him about inappropriate content. For the children in School 1, I actually observed or was told about far more examples of overt pedagogical strategies in the home. However, the type of strategy, the level of control and the focus of the reflection differed across households. For example, Anna's mum was using instruction, explanation and

demonstration with Anna around schoolwork and everyday information seeking. The twins' mum was monitoring from the side-lines, prompting with questions and providing feedback. These **interactions** reflected different perspectives on how to support learning. Anna's mum sometimes took over the keyboard, frequently pointed to bits of the screen making suggestions about where to click whereas Luke's mum guided from a distance, shouting out suggestions. Lottie's mum was on hand, but only intervened when help was asked for. The type of help she offered was less functional and more about understanding the nature of the online world, for example trying to explain to Lottie about not just looking for a "right answer". Will's mum shared exploration with him, modelling good practice and gently prompting. More than anything she too helped to contextualise use. With Will explanation and modelling emerged from lived experience, rather than rules of "proper" use.

Parents also made use of different **resources** in trying to guide their interactions. Anna's mum consciously used correct terminology, Will's mum and dad had used an e-safety video and Tom's mum used guidance she had found on her ISP website. Several parents mentioned feeling the need for resources, two suggesting that parental "IT clubs" or courses would be a good idea. Linked to this was an acknowledgment in some cases that parents were also learning from children, either in terms of functional skills or more widely seeing new affordances in things.

However, the area where there was most consistency across families was in parents providing **emotional support** as a way of scaffolding interaction. Sometimes this was in response to altercations, sometimes frustration at not being able to do things, and sometimes simply the transitional moment of stopping use. One parent commented on the nature of engagement being more open-ended and ongoing: Netflix episodes, *Minecraft*, levelling up are all things with less defined cut-off points encouraging immersion. In some families this is leading to a paradox where 'down time' is being perceived as stressful, because the moment of finishing or transitioning back to non-device time is emotionally difficult. Parents were often managing these moments. In contrast, when there were emotionally difficult situations in school, such as the social dynamics around PowerPoint for Will and his friends, this was often overlooked.

Cultural

Across these portraits I have drawn attention to some of the family values that were implicit in decisions made about technology use. In particular parents were striving to domesticate devices in ways that preserved (or enhanced) family connectedness, provided a balanced life and created (or at least did not close down) opportunities. However, there were differences in how narratives around these values were understood and enacted. In terms of **family connectedness,** as I have shown, some parents were keenly involved in their child's use, co-creating, sharing their enjoyment and valuing their interests and worlds from the inside. Others were happy to provide environments in which this could happen between siblings. In terms of **finding a balance** between device use and other activities, this was justified differently. Although Anna and Tom sat at opposite ends of the spectrum in terms of device use, both parents were motivated by protection. For Tom's mum it was safer to have him occupied in the house than out with other boys, the only other option she felt she had. Anna's mum felt the need to control the boundaries of Anna's use to prevent the balance tipping towards types of use she found threatening. The other families justified the need for balance in the context of outdoor activity and healthy behaviour. Lottie's mum in particular emphasized the importance placed in their family on separating technology and nature, for example by never taking an iPad camping. Other parents mentioned outdoor activities their children engaged in regularly, along with getting a balance between device use and more traditional or social play. In terms of **creating (or not denying) opportunities**, this was articulated by different parents as being for their education, their personal interests or more vaguely "the future". For Will and Ben there was already a sense that technology might offer opportunities to develop particular talents and both mums were keen to encourage these. Joe and Anna's families felt the need to keep up so their children would not be "held back" or "left behind".

There was also evidence that family values and **being a "good parent"** were being challenged by the ongoing evolution of devices and social practices. There were several reasons for this. Firstly, parents spoke of the influence of children's peers, wider family members and school. Anna's mum was

concerned that more lenient wider family members had taken away her control over the boundaries of use. Tom and Joe's mums had both provided the children with particular things because it was what their friends did. Implicit in Joe and Lottie's families was the sense that resisting technology was hard work. Although some said they trusted school to provide them with guidance, Anna's mum felt that school had introduced Anna to things that she would rather they had not. In some cases, the messages about technology use that children were getting from teachers were less positive than those they were getting at home. Secondly, there was confusion about what 'good use' might mean. Several spoke of feeling the need to constantly research for new narratives, guidance or explanation and mentioned feeling ambiguous about whether the internet was 'good' for learning or a distraction. One mum said she was finding it very difficult to know where to go to find more positive examples of use. This was of interest because it suggested that it was access to useful narratives as much as narratives themselves that was a potential barrier to more reflective engagement. In some ways the problem is not that resources do not exist, but that finding and reading them takes time. Although they had their own feelings about the value of technology, most parents had an over-riding sense that the world was changing and they needed to "keep up" in order to be confident they were doing the right thing for their children. Most felt the pace of change made this difficult and expressed the feeling of never having enough time. Finally, there was sometimes a challenge of **intergenerational difference**. Although intuitively parents felt it was important to understand and share use with their children, some found it difficult to be interested. In addition, as some of the children effectively had more free time to spend on devices than adults almost all the parents in this study felt that they were also trying to "keep up" with their own children and that the ground was shifting in terms of expertise.

RQ3: Emergent reflection

In the early stages of my reading and analysis when I was trying to define what emergent reflective engagement might look like I identified four elements which I anticipated might be found in the lives and practices of children this age: balance, affective experience, trustworthiness (and appropriateness) and visual criticality (Figure 1).

As with my other research questions I was curious to explore whether these issues seemed genuinely relevant in children's lived experience and practices and whether there was tension or crossover with the ways in which they were understood and shaped by adults. In the first instance therefore I will highlight where examples of these elements were found and whether they emerged from practice or were ideas that parents brought to bear. Secondly I will highlight other insights my findings revealed and how these suggested a shift in thinking.

Balance

In the previous sections I have already touched on how issues of **balance** were important to parents. Almost all referred to this as part of their rationale for decisions made – although they had different sense of what a balanced life would look like. However, none had specifically talked about this with their children and no child mentioned the word or the idea either. The closest a parent came to talking about balance was Anna's mum who told me of a conversation she and Anna had had about not forgetting how to play. In School 1, I heard one comment from the teacher about computers "distracting" the children from their learning, but this was not developed into a discussion. In School 2, children were on one occasion asked to weigh up whether using a children's encyclodedia or Google had been a better way of finding information. Overall, the need for balance, identified as important in the literature, was something that parents and teachers were conscious of but which seemed to have played little part in any discussions with children themselves.

Affective experience

Being aware that the affective experience of device use can have consequences was another area of potential reflection identified in the literature. Again I have highlighted in the previous sections that managing emotions (or the **affective experience**) is one of the most common ways in which parents support children's engagement with device. Several parents told me of occasions when there was emotional fallout as a result of an episode of device use. What is of interest here is whether any of them took this a step further and invited more general reflection on the affective experience of device

use. This would be akin to the kinds of approach recommended by Parry, where teachers found ways of inviting reflection on personal responses to things (2010, 2014, 2015). This was something that I would argue the teacher in School 2 was doing through her snack time discussions. Similarly Will's mum and to some extent the twins, after the *Five Nights at Freddie's* episode, indicated that discussions would sometimes arise from lived experience. Will's mum phrased this as "valuing their world". On the other hand the affective experience over several lessons of Will's group making a joint PowerPoint went under the radar and this opportunity to reflect on the emotional impact of use was missed.

Trustworthiness

In the previous section I mentioned the attempts made by Tom's teacher to encourage him to think about what guaranteed the truth of the information he found on the internet. This was the most overt attempt to raise the question of **trustworthiness** of information and in that episode Tom was dismissive in his answers.

REPEATED PARAGRAPH REMOVED

Several parents had not spoken to their children about trustworthiness, even though they themselves were aware of it as an issue. Joe's dad, referring to Joe's older brother, commented that "I don't suppose it matters much when they're only 9" and the twins' mum acknowledged "It's been on the BBC website that I'm perceiving to be true and real … I probably haven't said that out loud [why BBC is trustworthy] and maybe that's naughty of me". For these parents there was a sense that children this age were still too young for this to be a necessary discussion. On the other hand, Will and Lottie's mums had engaged in co-use with their children around Google, and had active discussions about the kinds of information to be found. However, rather than focusing these discussions around trustworthiness they used the concept of **appropriateness**, to explain that there were lots of types of information and help them find something right for them. Interestingly both Will and Lottie used the word "appropriate" in other contexts whilst I was with them: Lottie when she came across some "free" games and Will to tell me he would not touch *Call of Duty*. In

fact appropriateness was probably the reflective concept most grasped by children in this study.

Linked to issues of trust and appropriateness, one thing that emerged in the literature and has long been part of the media tradition of reflective engagement is commercialism. Reflection around this issue was one of the most notable absences in the present study. Although three of the parents in the study mentioned adverts as 'not appropriate', leading to 'pestering for toys they want' and 'gender stereotyping' none had talked specifically with their children about how to recognise them or what they are for. At least two were aware that adverts were either 'popping up' or being seamlessly incorporated into games, but had not had conversations about this. One mum expressly said she thought her children knew "what adverts are from the telly but I don't know if they get pop-ups". Not only were parents not talking about adverts, none were aware of any of the available tools for blocking adverts. In addition, many were allowing their children to download 'free' apps, with no interrogation of what 'free' might actually mean, often more exposure to adverts. Similarly in School 1, adverts were appearing frequently on screen, a fact of which teachers seemed unaware.

Visual criticality

Finally, in terms of the elements of reflection identified in my literature review, one of the most noticeable gaps in terms of supporting reflective engagement across this study was in terms of any critical engagement with images. I have referred earlier to the difficulties of navigating the visual landscape of the screen without guidance. Given the prominence of visual modes of interacting it could be argued that there were several other ways in which opportunities were being missed to develop more visual literacy, both in terms of reading pictures critically, but more in terms of use of images as currency. As one example, during the course of my study 'sharenting', the distribution by parents of photos of their children, emerged as a common practice. In the case of my own participants, many were creating a digital footprint for the child, but were unaware that this might be an issue – even, in the case of one family, when the children themselves made comments about it: "Often if we take a picture …

they're like 'oh no you're not putting it on Facebook again are you mum?' There's a bit of censorship you know 'we're so fed up of our photos going on Facebook'" In this family it simply hadn't occurred to parents that sharing their children's photos might cause them embarrassment, either now or in the future. In other families, family photos were also shared on Facebook, but only one mum mentioned that she had stopped doing this 'because it can get you into trouble'. Another family were aware that their child had been taught not to share personal information online, but had not made any connection with their own Facebook practices. In school another way in which images were used with no reflection was in the accepted practice of copying and pasting images into PowerPoint to make them look more interesting. One teacher even made a distinction between the ethics of copying words and pictures: "OK so there's no copying and pasting. Only pictures. You're allowed to copy them." Advocates of digital citizenship argue that we should be discussing ethical use of internet material from a young age, but this is in stark contrast to common practice where copy and pasting images into PowerPoint is one of the easiest and most engaging ways of getting children to research and present information.

Starting with these "elements of reflection" highlighted that although they were relevant to the lives and practices of young children, there were often missed opportunities or even barriers to developing reflective engagement around them. It also suggested a shift in focus towards thinking about what might be needed to facilitate more of these moments.

Looking for "moments of reflection"

The twins' mum and Joe's expressed the view that they would talk about the potential dangers of being online "if there was a problem" but would rather the children just didn't come across anything unreliable or upsetting. Anna's mum made the comparison with sex education:

> Mum: My mum and dad were teachers and they were saying for some kids it was like really damaging because they didn't know about it and as soon as you told them they went out and you know tried stuff out, it was really not the right way to go about it

However, in terms of where reflective engagement was actually happening in children's practices, the catalyst was often something either quotidian or ephemeral: a random click, a passing comment or an upset friend. Lottie tells me that she chooses not to do certain things with her friend "because say I had more goes than Cara she would say 'hey you had more goes than me, that's not fair'", Will's friends get upset because they are "deleted" from PowerPoints and Tom's friend Rachel tells him that clicking on a related link to a police shooting is "not appropriate". The consequences were sometimes emotional, sometimes social, sometimes moral. They were not usually dramatic, although occasionally an unreflective click had led to something more serious, for example when there were financial implications. One of the dads in the study, who was also a teaching assistant in a Reception class, suggested that some of these casual moments might be good starting points for discussion. He described his children "clicking 'print' a thousand times then you take them a wad of paper that's all been printed out …we've had one this week where 49 pages came through … Of nothing. Just a line on a page". Looking across my findings there were other moments like this that I observed or was told about that might also have been good starting points for a conversation – Joe's sibling fight in *Minecraft,* Lottie's interaction with the school network, the use of images in research tasks in both classrooms. Although these moments might mundane, it could be in building on these moments that the seeds of reflective engagement are sown.

Across my findings I saw or was told about a range of instances of reflective engagement. However, these were not necessarily around the issues I expected, they were often sparked by quite mundane or ephemeral moments and there were also missed opportunities. Some issues were not mentioned at all, even on occasions where moments of potential reflection could have been developed. Most importantly, reflective engagement was something that not only children but adults too needed support with. What my findings suggested therefore was that a shift in my thinking was needed. Rather than asking what characterised individual children's emergent reflection and understanding, my findings led me more towards identifying what instances of reflection and understanding appeared in children's school and family contexts and what were the catalysts or barriers for them.

As I move into discussing my findings in the next chapter I will therefore return to the overarching aim of this study, which was to reconceptualise the ways **in which parents and teachers might support young children in having reflective engagement around online device.** In fact, what my findings strongly suggested was the need to reframe this as less of a one-way process. It was clear that materially, socially and pedagogically the process of shaping engagement was a mutual one and I felt that reflection could be better conceived in terms of dialogues and networks. Drawing on the findings reported in this chapter I will therefore suggest and discuss a more pragmatic framework for encouraging and supporting reflective engagement.

Chapter Four: Discussion

The over-arching aim of this study was pragmatic and initially articulated with the research question:

How might parents and teachers encourage and support young children in reflective engagement around online devices?

The main finding of this thesis is that supporting reflective engagement is not a one-way process from adults to children. Rather, reflective engagement needs to be seen arising in dialogic relationships and spaces. In encouraging it to thrive, not only children but adults too need support. In retrospect therefore my research question is better phrased as

How can reflective engagement be encouraged and supported across the life worlds of 7 year olds?

The three initial research questions I have reported on in the previous chapters were designed to provide the foundations for addressing this larger aim by stimulating grounded exploration of practices in context and interrogating the usefulness of existing frameworks of support identified in the literature. Whilst these questions and the conceptual model (Figure 2) I outlined to address them were helpful as exploratory tools, I also found they had limitations. Firstly, although children's practices are shaped by material, social, cultural and pedagogical aspects of their contexts these are all interconnected. Secondly, practices cannot be seen separately from the contexts in which they take place; indeed practices are themselves shaping these contexts. Finally, reflective engagement with online devices is emerging in messier ways than were presented in such a neat model.

During the course of my study, new research emerged and my own reading expanded taking me in new directions. In particular there was a shift in my thinking around the use of the ecological metaphor, towards an alternative use of an ecological approach, used in community literacy research, that in

retrospect I feel would have been suited to this study. In this approach literacy practices are seen as circulating within sites and spaces (Neuman and Celano, 2001 as cited in Pahl & Allan, 2011) and research seeks to identify the spaces within a community where 'resources for literacy' are 'available' (Marsh, 2003; Pahl & Allan, 2011). As in my own study, these approaches focus in a wide sense on the environment, everyday activities and the activity settings that people come to learn within. One particularly interesting concept here is Brandt's notion of 'literacy sponsors' (1998)– people or events that make literacy more visible in people's lives and act as role models for literacy.

Moving forwards, I felt this idea of "sponsors" offered generative potential as way of conceptualising support for reflective engagement. Four concepts had emerged strongly across my findings, bringing together in different configurations the interconnected aspects with which I originally framed my questions. These concepts were practices, spaces, roles and resources. In a pragmatic sense I saw each of these as having potential to be a key "sponsor" in relation to reflective engagement (Figure 3). By using them to frame discussion of my findings in relation to the wider literature, I hope I will be able to offer some new ways of imagining possibilities for support.
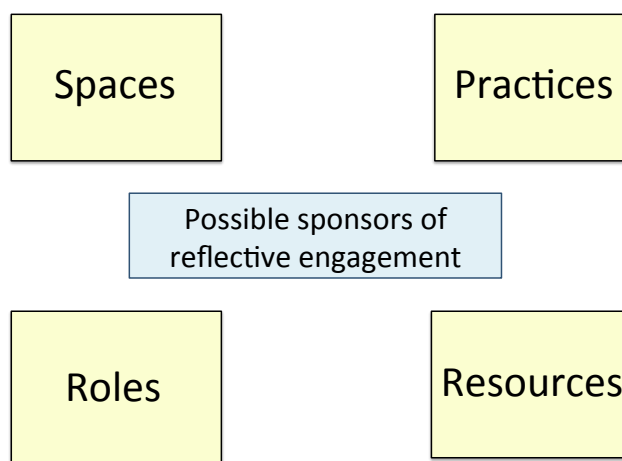
Figure 3: Revised model of support for reflective engagement

Children's practices

My study found that children are engaging in a range of multi-modal practices across home and school from an early age. These findings are broadly consistent with other studies that have looked at young children's practices in the intervening period. Playing games is the most popular activity on devices (Chaudron, 2015; Livingstone, Marsh, Plowman, Ottovordemgentschenfelde, & Fletcher-Watson, 2014; Marsh, Hannon, Lewis, & Ritchie, 2015; Marsh et al., 2015), along with watching videos (particularly via YouTube or streaming services like Netflix) (Marsh et al., 2015) and listening to music. YouTube is the most popular site (Livingstone et al., 2014), along with CBeebies and CBBC, Google and Wikipedia. Children also love taking photos and videos, sometimes random, sometimes more purposeful (Livingstone et al., 2014) and are communicating via messaging and video calls with extended family (Plowman, 2013). In many cases children are also participating in the social networking activities of parents and family members (e.g. Facebook) (Marsh et al., 2015)

Researchers have suggested that "digital environments offer children unprecedented plurality in their dealings with the world around them" (Craft, 2010, p. 50) and have described the proliferation of networked technologies as creating a state of "polymedia", where the choice itself of which device or platform to use carries social and cultural implications (Madianou & Miller, 2012). My findings suggest that from a young age children operate in a landscape of pluralities at the level of device, mode and platform. For children there are no fixed or "proper" ways of doing things. They expect there to be multiple ways of accessing, playing with or achieving things with devices. When thinking about what reflective engagement might mean, homogenised descriptions of "use" are not helpful.

Other studies are mixed in what they report about "educational" engagement at home. Nansen et al. found use of the internet for learning was a major part of home use, particularly with the widespread popularity of *Mathletics* (2012). In contrast, Chaudron found "little use of digital technology made to support explicitly learning or education" (2015, p. 18). In my study there were some children who enjoyed using technology at home for learning and others who did

not. Like other studies "educational engagement was generally restricted to information gathering using a laptop or computer, creative production (such as drawing apps), instructional online videos and factual programming (via YouTube clips)" (Livingstone et al., 2014, p. 3) although in my study at least one child was using "educational" apps. In terms of what was motivating use for children, my study found that the main motivators of activity were amusement of self or others, social bonding and mastery. This too is supported by other studies. Livingstone et al. found that children were driven by fun and relaxation, sharing with siblings or friends, passing the time pleasurably when alone, testing themself (getting to the next level, trying out a new challenge) and possibly informal learning (Livingstone et al., 2014, p. 26) and Marsh et al found that 0-5s were driven by fun, learning new skills and achieving a sense of mastery and watching videos to wind down (Marsh et al., 2015). The latter also found de-motivational aspects of use, such as tablets freezing or apps being difficult to use. This led to frustration and play stopping. In my own study on the contrary I saw several examples of children persevering or working their way round problems like these.

One way of seeing practices that emerged strongly from my own data and is supported in other studies, is that it is visually driven (Gardner, 2017). In terms of consumption, the shared viewing of photographs was a significant activity, either in person around a shared screen, or via Facebook or text messaging (Livingstone et al., 2014) as was the practice of image scrolling. In terms of production, visual customization was a popular practice, from avatars to PowerPoint. Even in terms of navigation visual icons played an important part. One study reports that "visual stimuli or audio commands were the primary markers for how all children navigated any technology" and that children relied in their use on "their recognition of logos and images" (Chaudron, 2015, p. 1). This was observed to work as a strategy for getting around, echoing some of the research in my literature review on the use of heuristics. In my study I also observed moments when children simply seemed to play with shapes created by the cursor on the screen, or the reflection of light from a mouse. Marsh et al. similarly note how children "played creatively with apps in ways not intended by the app producers" (2015, p. 43). Through exploring the affordances of the app in what she calls a "transgressive manner" new games are invented. Burnett

also describes various forms of on-screen play, including "using function keys to toggle between different screens, varying the size of the log-in box or constructing geometrical shapes on the desktop", (2013b, p. 9) episodes similar to ones I had observed. She sees these as being sometimes motivated by personal gratification and sometimes as "demonstrating a new trick to friends" (2013b, p. 9). Referring to this as "a kind of squatting" or doodling, she argues that paying attention to the ephemeral messing about which occurs in the gaps between "official" tasks, can shed important light on children's affective and social experience. This way of looking resonated with how I saw things.

Peripheral practices

One thing that emerged strongly for me when characterising children's practices was the value of also paying attention to their wider repertoire of 'peripheral' (or transitional) practices and how these might lead to reflective engagement. At times there was a sense of purpose to children's screen play. At school they might be looking for something they had previously made or exploring the functionality of new icons or menu items to discover ways of improving their work; at home they were searching the Play Store, creating playlists and changing the wallpaper on home screens. At other times these practices appeared more random. As children clicked on screen ephemera, scrolled up and down though images and explored related links they often appeared to be just messing around or idling. However, considering all these activities through the same lens and looking at the ways in which children were beginning to engage with what they were actually seeing on the screen I recognised that it was not just in structured and purposeful activities that understandings were constructed and issues encountered. Another framework which pays attention to all aspects of engagement from fiddling with the on/off switch to creating full-blown role-play videos, links many peripheral activities with learning how to use technology, something they categorise as 'epistemic play' (Bird & Edwards, 2015). In terms of reflective engagement my findings suggested these practices offered insights not just in to their functional engagement but also their conceptual understanding of what lay beyond the screen, and their identity practices.

My findings suggested that children were curious and exploratory. They sometimes interpreted screen data in unexpected ways. On one occasion, looking at screen of a folder of documents, one boy read the size of the document as the number of "views" his work had received, surprisingly in the hundreds. When I asked them to tell me what particular icons represented they were confused but imaginative in their responses. On many occasions, particularly in School 1, I observed children spending time experimenting with the multi-modal features of navigation as well as texts themselves. However, they all found it difficult to articulate any understanding of what it meant to be "online" or how the Internet worked. Indeed, on my first visit to School 1, one boy told me "I love the Internet, but I never go online. It's too dangerous". Livingstone et al. report a similar situation, with parents mentioning "navigation, [and] use of buttons and search" as things they saw children learning but saying they did not think the children understood "what the Internet is, what 'online' means or the wider online world that the screen could link them to" (2014, p. 26). Digital screens are inherently multimodal environments. As one recent report highlights: "in the current digital era, where information is readily accessible in online and networked storage systems, reading … involves navigating and making insightful and productive use of extensive resources in ways that are locally relevant" (Sefton-Green et al., 2016). This understanding of reading, as "design" (Kress, 2003) applies equally to children's transitional practices.

I saw children's material interactions and exploration of the multi-modal language of navigation, storage and connectedness as a starting point for conceptualising and creating expectations about the online world. What was of interest therefore was how reflection was encouraged or inhibited by what children actually saw on screen. It is interesting to reconsider Lottie's engagement with her school network in this light. On the one hand, the adult visualisation of the network made what 'lay beneath' almost impenetrable. This could be seen as a barrier to any reflective engagement. On the other, because it was not straightforward to navigate, this led Lottie into being more flexible, adopting different problem-solving strategies in order to try and find her work. Some researchers have argued that one of the key factors in children developing genuine 'web literacy' is flexibility (Kuiper, 2007). It could be argued

that if you do not expect only one right way of doing something and are willing to explore alternative ways of doing things this implies a flexible attitude. One way of encouraging a more reflective attitude when children are motivated by mastery might therefore be to pay more attention to what happens in these in-between spaces and build on curiosity about the affordances of screen icons. In her explanation of guided interaction, Plowman and Stephen describe how the concept originated more in human computer interaction and focused on making suggestions for ways in which interface design itself could guide interaction (2007). This included features such as "making 'help' easily available and targeted, including an introductory guided tour to demonstrate the available content, making apparent the connections between sequences and guiding progression from one sequence to another" (Plowman & Stephen, 2007, p. 15). Although it was beyond the scope of the present study to engage with the literature of human-computer interaction, interesting examples of research that involve children in the co-design of interfaces can be found in the work of (Bilal, 2005; Jochmann-Mannak, 2014) and offer further avenues to explore in this respect.

Returning to my literature review, one of the suggestions made by Pangrazio in her tentative model of critical digital design is the importance of analysing not only the specific multimodal features of digital texts, but also the "general architecture of digital technology and the Internet, so that a more comprehensive and nuanced understanding of these concepts is developed in the learner" (2016, p. 171). I will return to this when I discuss resources later in this chapter.

Identity practices

Another way of thinking about peripheral practices is to see the processes of downloading, creating playlists, customising screens and showing off or sharing on-screen visual creations as equally meaningful activities for young children. A detailed comparison to this is found in Marsh's description of a four year old boy navigating the complex interface of YouTube and able to swipe, scroll, minimize and find his way through menus and sub-menus. Even at this young age, Gareth has his own YouTube channel to which he is adding favourites, thus

personalizing his use. Marsh suggests that by "curating" (Potter, 2013a) his own digital collections, Gareth "was developing independence in his use of the Internet, able to find videos quickly that he liked to watch repeatedly" (Marsh, 2016, p. 374). Potter has suggested that "curatorship" is a new cultural practice which is becoming a feature of life from the earliest years (2013a). He uses the idea to describe the way children are creating autobiographical media spaces by collecting, cataloguing, arranging and assembling of a variety of (online) media 'texts' for exhibition and display. Potter's research with older children has explored how this identity construction and affiliation is "developing in social media spaces, in still and moving image mixes and remixes" (2013a, p. 77) but, as Marsh's example suggests, there is value in looking at emergent versions in much younger children, particularly as Potter argues this could be an essential life skill; the management of resources and assets made for, by and about us in a range of media (2011).

In the classroom too, peripheral activities play a part in children's identity practices, but in a different way. Burnett's research has characterised in detail the way children negotiate the boundaries between the public display of work on screens and more individualised spaces typical of work in books and on paper (Burnett, 2013a). She talks of how children sometimes operate within what Goffman describes as a 'concealment track', for example by angling laptop lids or creating barriers with their arms so their work is not visible. In so doing they can be operating in more than one 'frame', that is to say they can be doing what is expected of them and doing something for their own (and/or their peers) pleasure at the same time. This was an interesting way to consider my observations of Tom and his practices around *Mathletics.*

Peer to peer

Another aspect of practices that it is helpful to understand is the importance of peer-to-peer relationships both on screen and around the screen. Several of the children in my study liked watching texts produced by and for other children or young people. Particular favourites were Lego unboxing videos or *Minecraft* walkthroughs. Marsh has commented that "the iconic figures in children's lived

imaginations may now be self-made YouTube celebrities, rather than the traditional celebrities of the past" (Marsh, 2016, p. 377). She describes one four year old boy's love of "videos featuring children talking to a perceived child audience" such as EvanTubeHD. Marsh offers a number of potential explanations for the appeal of products produced by other children including the reflection of life similar to their own, the vicarious pleasure of opening, the sense of participating in a LEGO-fan 'affinity space', the enjoyment of mystery and suspense, or the emotional response triggered by the aesthetic experience of seeing hands and hearing unwrapping noises (Marsh, 2016). Several of the children in my own study watched these vlogger videos too. Recognising the affinity children feel for peer-produced material might be important to take into consideration when thinking about how to support reflective engagement.

This interest in texts produced by peers was replicated in the classroom where the visibility of screens led to a culture of making things to be shared with and appreciated by others. In my study these objects of interest were visual customisations. I noted several occasions social interaction around device was as, if not more, important than whatever is happening on screen. Burnett draws attention to episodes such as these, arguing in a particular episode that one child assumes various roles around others' on-screen texts "acting as expert (in logging on), critic (of the girl's work) and comic (toggling between screens and reading out his story)" in order to establish a dominant position within his group (Burnett, 2013a, p. 5). Another study that offers rich examples of peer interaction is Bailey's year-long ethnography of an after school *Minecraft* club (Bailey, 2016). In describing an episode where the children spontaneously and collaboratively created and performed a song - "Free the Sheep" – based on the song "Feed the World" he analyses how children negotiate "the complex business of being together" in and around a collaboratively produced virtual place (Bailey, 2016, p. 70). On the one hand Bailey argues this presents an alternative to characterizations of "schooled collaboration", as the children "autonomously appropriate[d] resources from the melting pot of their own experiences, collaborating and adapting them for use … [without] relying on guidance from the club's supervisory adult" (Bailey, 2016, p. 70). On the other hand, and a point of interest for the present study, he shows how the song was used to resolve issues and air differences of opinion amongst the children,

suggesting the "performance was used for recruiting, regrouping, uniting and opposing in multiple locations" (Bailey, 2016, p. 70). By analysing ephemeral moments and peripheral incidents, studies like those of Burnett and Bailey can provide a more nuanced explanation of how classrooms generate a sense of community and shared engagement (Burnett, 2013b), features I would argue are also crucial to developing a culture of reflection.

Interestingly something similar is observed also in a study of interactions around iPads in a pre-school classroom, where it was noted how children "shared activities, took turns, supported each other's learning and rejoiced in each other's successes" (Flewitt, Messer, & Kucirkova, 2015, p. 20) and one teacher articulated that "'some of the nicest interactions were when there was a whole group of children around it and they were all talking between themselves so that was good ... it wasn't just the person who was touching the iPad but lots of talk lots of turn-taking ... sometimes there were tears but that's part of learning that you're not the only one'" (Flewitt et al., 2015, p. 21). It could be argued that managing joint play is a big part of learning about life around devices. Paying attention to the ways in which children negotiate shared engagement on and around the screen therefore is crucial if we want to better support children to engage reflectively.

Turning a more social lens on to children's daily practice brings useful insights into some of the consequences of use that matter to them. Unlike the bigger threats outlined in popular discourse, it was in more mundane moments that children experienced upset: the emotional fallout of Will's PowerPoint for example. This echoes the findings of other studies, which report being socially excluded from games by known friends or encountering virtual losses (games being hijacked or ruined) (Holloway et al., 2013) and friends trying to discover the passwords for children's online sites to access and alter profiles (Nansen et al., 2012) as incidents that upset children. Marsh has argued that children's participation in online virtual worlds, where they can play with identity and engage with others, offers "useful opportunities to develop skills that will enable them to navigate online environments more safely and appropriately" (Marsh, 2010, p. 36). However, this needs guidance. She quotes one seven year old girl who told of her own anti-social behaviour in virtual penguin parties without a sense that this was a bad thing (Marsh, 2010). Some people argue that it is

precisely moments such as these that make good starting points for discussion of consequences that are easy to relate to (Selwyn et al., 2009). Although they may seem quite small, they nonetheless raise questions about how children treat each other in the contexts of emerging online relationships. It is argued therefore that discussing and building on such relatively minor breaches of trust by children's peers "may help to develop the necessary awareness, competencies or expertise required for possible future encounters with online risks" (Nansen et al., 2012, p. 8). It could be in building on these moments that the seeds of reflective engagement are sown.

Spending time with these children and then comparing my findings with current literature paints an interesting picture of contemporary practices. What this suggests is that i**f** we start to see practices as **plural, pleasurable, peripheral and peer-to-peer** this can open up new ways of thinking about what reflective engagement might involve and where it might be supported.

Spaces

As I have indicated already, the findings to each of my research questions were interconnected. Across them certain tropes appeared and reappeared. The first of these was the notion of spaces. Drawing attention to the ways in which we define, find, critique and create spaces around device use, I felt might generate ways of thinking about how to better support and encourage reflective engagement. In this spirit the following sections were starting points for discussion.

Boundaries

One of the major challenges to reflective engagement I observed in this study was the fluidity of boundaries in terms of space, time, and ownership and the increasing burden of responsibility on parents and teachers to shape device use for children. Depending on how parents responded to these challenges, different opportunities for reflection were opened up or closed down.

Ever since computers began to be domesticated in the home, research has

pointed out that the way families make space for devices is a first step in shaping children's attitudes and engagement (Facer et al., 2003; Haddon, 2007). Recent studies also highlight that the "meaning of a device (its affordances in a particular family or for a particular child) was not fixed" (Livingstone et al., 2014, p. 24), but depended on context, parental interest and modeling. My findings suggested that in some households practices were in a transition period between more fixed, stable definitions of how technology fit into the home, and newer, more fluid boundaries around use brought about by mobile technologies. The possibility for children to take devices opportunistically into their bedrooms or outside, for example, made old boundaries such as outdoor play being favoured over digital play, or devices being kept in shared spaces, harder to keep fixed. Scholars of children's home use of technology have drawn attention to the fact that "perceiving the functionality or location of technology has become more difficult now that it is not only omnipresent for many families but also increasingly invisible" (Plowman, 2016, p. 196) and that "transparency and ubiquity of technology [is] a feature of [children's] daily existence" (Marsh et al., 2015, p. 7). In terms of children's play it is also evident that online and offline boundaries are fluid, and multimodal practices move dynamically across these domains (Marsh, 2014, 2016). Both my study and others observed children taking devices into other play worlds – dens, trampolines (Marsh et al., 2015) – or engaging in transmedia play across a range of platforms and toys. As Marsh points out: "it is futile to separate children's engagement in 'real' and virtual environments … instead, we should view their experiences along a continuum in which children's online and offline experiences merge" (2010, p. 25). Marsh's work has led to the creation of a "digital play" framework to articulate continuities in a range of play types across online and offline domains. Remembering Anna's mum's comment that she didn't want Anna to "forget how to play", this would be an interesting stimulus to share with parents and teachers.

Another way in which families shape device use is through how they make time for it. Stevenson points out "the ways in which certain time spaces, such as the home, are constructed, framed, and shaped in particular ways … privilege certain activities over others at different times" (Stevenson, 2011, p. 396). In my study parents talked about devices in relation to "down time", "family time" and

"screen time". Each embodied a set of values and assumptions, which in turn affected the kinds of opportunities for reflection that might occur around them. "Screen time" is of interest in this respect, as it is a heuristic for sensible use that many parents are familiar with. However, here too the blurring of boundaries is "evident in the recent American Academy of Pediatrics' (AAP) comment that '"screen time" is becoming simply "time"', and therefore to some extent part of every aspect of daily life" (Blum-Ross & Livingstone, 2016, p. 6). The latest guidance on screen time now recommends that rather than quantity of time, it is quality of time that matters. This guidance advocates that parents should instead be asking themselves and their children questions about "screen *context* (where, when and how digital media are accessed), *content* (what is being watched or used), and *connections* (whether and how relationships are facilitated or impeded)" (Blum-Ross & Livingstone, 2016, p. 4). Given that several parents in my study talked of liking advice in small chunks, this is harder to negotiate than the simple "two hours a day" mantra some had absorbed from the earlier advice.

There were few examples, in either my own study or others, of definitions of "family time" involving shared device use beyond the common practice of family film watching. One family explicitly told me they no longer even watched any television together now the children just watched YouTube. The major exception to this in my study was Will and his family. In other households, "family time" was usually framed in terms of going for walks, playing board games or going for days out. This is reflected in other studies, which suggest "shared family activities tended to centre on non-digital activities that signalled 'good parenting' (in the eyes of parents)" (Livingstone et al., 2014, p. 3). When there was shared use it was more deliberate and often centred around the parent helping with school-related activity. The delineation of certain types of time can be one way in which parents shape levels of support. What was of interest to me was that although defining formal time structures as "homework" might have been framing the stage for a discussion of good use, in reality, as I will argue presently, the moments for reflection were not planned.

Finally, something that emerged as interesting from my findings, but which I had seen less on in the literature, was how blurred boundaries of ownership might

be helping or hindering reflection. One study points out for example that when children use a parent's smartphone, "they use a device that has not been configured for their use and that usually connects automatically to Wi-Fi once available" (Chaudron, 2015, p. 14). This can lead to a situation where children are at increased risk of encountering pop ups and in-app purchases for example, particularly as most parents choose to use free apps (Chaudron, 2015). In my study equal numbers either owned their own devices or used shared family devices. Depending on whether tablets were defined as personal or shared property, children experienced their use differently. I have drawn attention in the previous section to some of the customization practices that children engaged in. In addition, owning or sharing a tablet brought with it benefits and downsides in terms of reflective engagement. For example, with ownership came some responsibility, but also more chance of things falling between the cracks. Shared devices usually led to delineation of different personal spaces on screen. Both of these offered opportunities for discussion around issues of privacy and personalization.

Interstices and opportune moments

Another way of looking at the porousness of boundaries is to look at in-between spaces. In my own study, it was clear that phones were being used occasionally in car journeys, or that time sometimes "stretched", for example to help a parent finish a domestic chore, but some parents also reported resistance to phones becoming ubiquitous. Other studies report more acknowledgment amongst parents that devices were "used to fill the gaps in daily life" (Livingstone et al., 2014, p. 3). Parents report having more relaxed rules in the car or in restaurants and under certain circumstances using them as a 'babysitter' (Zaman, Nouwen, Vanattenhoven, de Ferrerre, & Looy, 2016), a time filler to deal with boredom of queuing or driving (Livingstone et al., 2014), or simply to have some time to themselves (Nikken & Schols, 2015). At other times children are overtly or tacitly picking them up when parents were busy, tired, cooking, shopping, driving or otherwise engaged (Livingstone et al., 2014, p. 31). Small, peripheral, opportunistic acts such as are yet another example of how boundaries between device use and daily life are becoming more porous.

Two things are of interest here. Firstly, the fact that adults are dipping in and out of observation of their children means that opportunities for reflection or discussion might occur unexpectedly at random moments. Secondly, the increase in potential for children to be doing stuff 'under the radar' means that many potential catalysts for reflective engagement might remain invisible. Livingstone et al. note that "much of young children's use of digital devices was … little noticed by parents" (2014, p.3) and that this led to some being unaware of things such as the fact that "that their child knew how to access the Google Playstore and download new games" (2014, p. 31). Parents in my study reported similar things: Joe's dad had not realized the boys knew how to find skateboarding videos on YouTube and the twins had downloaded a *Five Nights at Freddie* trailer despite it being age-rated for 13+. However, to balance these, studies also mention that the portability of devices can also lead to positive outcomes, the mobile nature of tablets making it easy for children to seek out help when they needed it meaning support could take place in a wider range of spaces (Marsh et al., 2015)

In discussing children's practices I drew attention to children's peripheral or in-between practices on the screen, highlighting that it is sometimes through these that their emergent reflection was being sparked. Here I would argue that a similar attention to the periphery or the interstices is useful when thinking about when and where reflective engagement might occur and be supported. Seizing the moments for reflective engagement thrown up by a more fragmented and opportunistic landscape is a challenge, but drawing attention to in-between spaces and times (opportune moments) as catalysts for reflection is the first step in doing something to support it.

Linked to the notion of interstices, another way in which a spatial lens can open new ways of seeing the reflective engagement potential at the boundaries can be found in a recent study of parents of 3-9 year olds (Zaman et al., 2016). This study introduces the idea of "**transitions**" to describe the moments when restrictive mediation becomes more active, as parents engage in discussions to negotiate or justify their rules or boundaries. For example, allowing children to have a say when coming off devices, discussing time and budget decisions to justify or negotiate the rules, having discussions about why "children should

engage in a healthy and varied program of leisure activities" and "negotiating purchase restrictions such as questioning the investment in a gaming console when they already had a tablet with access to a variety of free or low cost games" (Zaman et al., 2016, p. 17). Unlike other studies they conclude that there are plenty of instances of 'active mediation' occurring in families with children aged 3-9 but that this is more likely to take the shape of "explanations and justifications towards the youngest ones rather than discussions" (Zaman et al., 2016, p. 23). This nuancing of active mediation, what it means and where it happens, is also reported in families of 0-5 year olds. Marsh et al also highlight an absence of active mediation in its more traditional sense where "parents and children use the internet together and parents help children to develop online safety strategies" (Marsh et al., 2015, p. 24). Instead they note that active mediation is related more to helping children develop strategies to manage their tablet use more effectively, including talking to their children about being patient and balancing their use with others types of play. In my own study, there was evidence in children's language and behaviour that they had 'learnt' as opposed to intuited certain concepts around reflection, in particular appropriateness, although often adults had not seen this as "having a discussion."

"Children's" screen spaces

As the previous section makes clear, a major challenge presented by this more opportunistic and fragmented use, is the trend towards more individualized screen engagement. Even amongst the youngest children it is reported that they "[use] the tablet independently for much of the time" (Marsh et al., 2015, p. 18). Research with 7 year olds concludes, "devices were often considered to be personal, and each activity online seemed to be predominantly engaged with on an individual basis" (Livingstone et al., 2014, p. 28). A recent report argues there are problematic implications to this, from the "potentially profound consequences for literacy" (Sefton-Green et al., 2016, p. 8) to the increasing targeting of this age group by commercial interests. Recognizing that parents often use devices like smartphones to entertain their children, media producers and developers are targeting younger and younger users (Gutnick et al., 2010). Research draws attention to the increasingly stealthy ways in which the online

landscape shapes our views and tracks our behaviours, with children particularly vulnerable to exploitation. On the one hand, companies are using increasingly stealthy methods of advertising, which blur distinctions between promotional and other content (Buckingham, 2009). On the other hand "opportunities to participate online are branded such that even when young people produce and share their own media, they do so under terms set by commercial interests" (Jenkins, 2009, p. 23) In addition, scholars are increasingly concerned about the rise of data harvesting, where organisations can exploit the internet to track the online behaviour of children (Lupton & Williamson, 2017).

In this context, where there is a more unmediated relationship between the child and the screen, inevitable questions are raised about the quality of screen content and how this shapes children's engagement. Livingstone is passionate in her view that the burden for being reflective in these relationships should not be falling on children. She berates the degree to which interfaces are poorly designed, "lucidity and transparency" are lacking and websites encode "preferred reading[s]" and is critical of the fact that "only rarely does the internet invite children to judge for themselves the truth or value of the information it offers them, nor do websites advise on the criteria by which such an evaluation might be reached" (2009, p. 206). Interestingly, a similar common sense suggestion, that the screen could provide reflection triggers, was actually mentioned by a parent in a recent study: "it would be quite nice if, in technology, although I don't really see it happening if they, if they're on a website like CBeebies or something and they didn't encourage them to play different games, if it would say, right, why don't you go off and make this? But I don't see they're ever going to do that really" (Livingstone et al., 2014, p. 27). The absence of anything like this is puzzling.

My own study did not set out to specifically analyse screen content. However, throughout my observations the quality of screen spaces that children were visiting, was something that led me to ponder how opportunities are shaped by what are defined as "children's spaces" and what enables adults or children to evaluate, challenge or critique these spaces. In particular I noticed this in the use of "educational" spaces, where for example, child-specific search engines

did not really seem to deliver and whether they were using "open" platforms like PowerPoint or more specific ones like *Mathletics* there was more evidence of children being drawn to open-ended play. In terms of how engagement might be pragmatically supported, I would argue that some of the spaces that children are visiting, and that are considered safe, appropriate or educational, would be a fruitful avenue of future exploration. One study that has done this, looked in depth at pre-school children's use of a range of "children's" apps and identified some of the features that appeared to lead to more creative use (Marsh et al., 2015). This study gives a more nuanced look at the opportunities for play and creativity offered by different apps, noting for example that apps like *Angry Birds* did not promote a wide range of play, *Talking Tom* was better but sessions were interrupted by pop-up adverts and the encouragement for in-app purchases and *Minecraft* was only successfully used to promote play and creativity once use had been scaffolded. It concludes the most successful apps "offered appropriate scaffolding for this age group and fostered autonomy and independence" (Marsh et al., 2015, p. 43). Those with narrow aims led to less creative thinking than open-ended apps that enabled a range of outcomes. Some of these findings are mirrored in a study of pre-school children's use of apps in a classroom setting. Here it was found that many "educational" apps were "based on outmoded behaviourist and/or transmission theories of learning, where the user practises particular skills and is rewarded with tokens of accomplishment and progress" (Flewitt et al., 2015, p. 14). These "positioned children as recipients of narrowly defined literacy knowledge, rather than as independent or collaborative and creative producers of original materials" (Flewitt et al., 2015, p. 14). Using more 'open content' apps engaged children more deeply in their own learning and it was noted how children particularly enjoyed the ease with which is was possible to undo mistakes and try again, something the study linked with confident learning dispositions.

There is much to be said about the quality, commercialisation and design of educational screen space, which is beyond the scope of this study. However, in the generative spirit of this chapter, what this bit of my discussion highlights is the pragmatic potential studies like these offer, the results of which could be more widely translated into guidance for parents and teachers. An example of how this is already being done can be found on the Common Sense Media

website, where reviews of particular games and websites contains a function on the menu entitled "Families can talk about".

Creating spaces for reflection

Burnett has argued that "[a] focus on the heterogeneity of space can help us understand barriers but also recognise new pedagogical possibilities" (Burnett, 2013b, p. 27). In this section I have attempted to identify practical ways in which support for reflective engagement might be enhanced. I have suggested it is possible to support reflective engagement by seizing opportunistic moments and spaces and recognising opportunities for dialogue in transition moments and interstices, and that parents can be helped to do this through more specific guidance around children's screen spaces that allow them to critique the spaces children engage with. Underpinning all of this however is the simple request that emerged both from parents and teachers of needing to 'find the time' to reflect. This is a recurrent theme in the literature on the barriers to more reflective or creative engagement with devices (Flewitt et al., 2015; Sefton-Green et al., 2016). Pangrazio argues that it is not just time but also 'space' to reflect upon use that is fundamental to developing a more critical perspective on engagement. She remarks "the speed and ephemerality of information in the digital era have caused many theorists to argue that the 'separate space' from which to launch critical analysis has been lost" (2016, p. 171) and suggests that in order to develop the skills to engage critically, young people need to be given a sense of 'distance' from digital media "through a series of activities and provocations that decontextualise everyday use and therefore encourage the individual to reassess, reflect and renew their engagement with it" (2016, p. 172).

Using spaces to bring together some of the recurrent themes that emerged from my findings has been one useful way of thinking about how to move forwards. It has sparked some practical suggestions but also many further questions about how research might contribute to supporting more reflective engagement with devices, for example around how to create environments that are conducive to reflective engagement or where the capacity is in primary school ecology for curating and critiquing some of the spaces offered to children.

Roles

It could be argued that the shaping of environments described in the previous section (what Plowman would call distal interactions) is one of the first roles played by parents and teachers in supporting reflective engagement. This concept of roles was another of the key tropes that emerged from across my findings and one I felt offered a way of capturing some of the heterogeneity involved in supporting reflective engagement. I saw the use of roles as a way of moving away from mediation as something always being done by adults for children. Although I initially identified what I saw as parental roles, I came to see roles as interchangeable, performed at different moments and in different places by parents, teachers, friends, devices and even the environment. I also observed that these roles did not simply work as a one-way process; in many instances adults too were in need of help and it was sometimes the children themselves who performed the roles. Other research has suggested that this lens can be practically useful because "understanding the generativity of a variety of learning-partner roles might help mentors and teachers imagine new ways to support [children]" (Barron et al., 2009, p. 74) or even just because "raising parents' awareness of their own roles may be the simplest way to bring a healthier balance to children's media practices" (Gutnick et al., 2010, p. 38). By drawing attention to the dispersed range of interactions and relationships through which reflective engagement might be seeded, I also hoped to spark some creative thinking about who (or what) is best placed to perform these roles and to reflect on how they might be delegated or networked.

Research in family literacy has long recognised that young children "learn about literacy as part of everyday life, in family and community networks (Kress, 1997; Gregory et al., 2004), and in diverse 'literacy eco- systems' (Kenner, 2005)" (Sefton-Green et al., 2016, p. 14). My own findings showed this was the case, with grandparents, siblings, neighbours and friends all playing a part in the construction of children's practices. Similarly in other studies, the role of siblings in guiding, supervising, encouraging and influencing young children's internet choices has been noted, although attention has been drawn to the need

to explore sibling dynamics in greater detail (Holloway & Green, 2013). Sometimes, as in my study, older children are presented as the "expert" in the family, with parents of 5-7 year olds in one study actually delegating their role as mediators (Vinter & Siibak, 2012) Research on younger children (0-5) has found that in addition to demonstrating and guiding how to play, older siblings are also choosing apps for younger siblings to download (curating) and playing alongside them (Marsh et al., 2015). This joint play was also observed in a study of 7 year olds, particularly in relation to *Minecraft* creating opportunities for numerous siblings to play together simultaneously (Chaudron, 2015). In addition, this latter study also found that older siblings were at times "pro-active in risk-prevention" of their younger brothers or sisters. Cases are reported of older siblings tailoring tools or settings to adapt them to their younger siblings. It is suggested that in families where use is facilitated by older siblings, children show more diversified skills and knowledge (Livingstone et al., 2014).

In terms of grandparents, other studies have also highlighted the positive role they play in encouraging the acquisition of skills, selecting appropriate content, socialising children to online technologies and providing opportunities to experiment (Livingstone et al., 2014). One study makes use of Green's '3D' model of literacy (1988) to argue that through these intergenerational interactions, children's learning was scaffolded across not just functional skills, but also cultural understanding and critical skills (Marsh et al., 2015)**.**

In starting to develop the concept of roles I returned to three frameworks I had used in my literature review and which I was keen to bring into dialogue: parents as learning partners (Barron et al., 2009), guided interaction (Plowman & Stephen, 2007) and active mediation (Duerager & Livingstone, 2012; Hasebrink et al., 2011; Nikken & Jansz, 2011). In their study of technological fluency in 12 and 13 year olds, Barron et al. identified the following **parental support roles**: Teacher, Collaborator, Learning Broker, Resource Provider, Nontechnical Consultant, Employer, and Learner. They suggest that parents play different roles at different times and in so doing provide not only "opportunities for the development of knowledge and skill but [also] opportunities for more general socialization of attitudes and perspectives on new media technology" (2009, p. 60). They also show that some of these roles

involve face-to-face interaction, whilst others are more to do with creating the conditions or environments for opportunity. Not all required technical expertise, indeed sometimes their role was to be a learner or learning broker; what was important was acknowledging that it was alright not to know and demonstrating other skills such as networking and listening

"Guided interaction"provides support not only in terms of operational skills but also for less measurable positive dispositions towards learning such as persistence, engagement and pleasure (Plowman & Stephen, 2007). It describes ways in which interactions with devices can be enhanced and actively supported and operates in two dimensions: proximal and distal. I found both of these useful in developing my own concept of roles. *Proximal* refers to the face-to-face interactions between adults and children that have a direct influence on learning (Plowman & Stephen, 2007; Stephen et al., 2013). Distal actions are "indirect activities, plans and decisions that support and influence children's actions and learning opportunities" (Stephen et al., 2013, p. 154). Two things drew me back to this framework. On the one hand it is designed as a pragmatic tool. Practitioners can use it "to raise awareness of existing, if isolated, actions as well as identifying the appropriate circumstances in which support could be offered in order to maximise opportunities for learning" (Plowman & Stephen, 2007, p. 18). It also raises awareness of times when "a child's self-directed exploration is more appropriate and, in these circumstances, the intentional absence of direct action may be a source of guidance" (Plowman & Stephen, 2007, p. 18). On the other hand, like the work on parental roles, it allows for the identification of a wide repertoire of interactions, both directly pedagogical and at one remove, which benefit the "orchestration of learning" (Plowman & Stephen, 2007). I outlined in my literature review the detailed breakdown of "scaffolding interactions". I had not set out to analyse specific interactions in close detail in the way Plowman et al. did. However my findings resonated with some of these interactions and in thinking about roles, I have found them useful

I highlighted in my literature review what I perceived as a need for more nuanced ways of characterizing and locating '**active mediation'**. Typically this means conversations about some aspect of online life. Although this was seen

as the most effective strategy for supporting children to be reflective and resilient (Duerager & Livingstone, 2012; Hasebrink et al., 2011), it was reported as being very little used with younger children (Ofcom, 2013). Implicit in my understanding of reflective engagement and what linked it to active mediation, was the belief in the importance of dialogue and discussion. In my findings, some parents told me they had made particular efforts to have conversations about aspects of online use, others had not. There were differences in what had been discussed, how often and in what way. Where they had not had any discussions, the reason given was that they thought their children were too young. This is in line with other qualitative studies that consistently find that parents "postpone worries about the risks of technologies to the future" (Chaudron, 2015, p. 15) and believe "robust strategies did not need to be developed until children get older" (Livingstone et al., 2014, p. 4). However, I did not feel this painted the full picture. My findings suggested that reflective conversations were smaller and more dispersed. What interested me therefore was what kind of conversations parents and teachers did have and could have with 7 year olds that could be smaller steps in building reflective engagement. Building on the idea of opportune moments in the previous section I saw roles as a way of thinking more laterally about where conversation triggers might be found.

I have drawn attention in the previous section, to the framework of parental mediation being developed by Zaman et al. (2016). As well as offering a more nuanced perspective on "transitions", where and when moments of "active mediation" might occur, this framework also offers more distinct ways of looking at what is actually meant by active mediation, differentiating between active mediation where conversations are instructive and where they are evaluative. The former involve explaining, discussing, and/or sharing critical comments. The latter "aims at a normative outcome, such as expressing (dis)approval" (Zaman et al., 2016, p. 6). This was also a useful guide in developing my concepts of roles. What I took from this work was the idea of drawing attention to possibilities for dialogue within each role. In so doing I suggest small steps (rather than big discussions) might be taken to encourage cultures of reflection. Within each role what was interesting was to note the issues that were actively discussed and what the catalysts were for this.

Drawing on my findings and these frameworks, I therefore identified the following as helpful roles in thinking about reflective engagement:

- Manager
- Curator/Gatekeeper
- Emotional Mentor
- Contextualiser

The point of outlining these roles is not to give a comprehensive account of all roles that could possibly be played. I have not included "model" for example, as I did not feel my findings added anything significant to what was already known and that I have described in my literature review. Rather, they are suggestive. They describe roles that I believe have generative power and potential for dialogic reflective engagement.

Manager

In the first instance adults are providers for children. They are the ones who either purchase devices for children, or allow them access to devices that belong to them. They also become device managers. In all cases parents have initially 'set up' the devices, making decisions about whether to materially limit children's landscape through parental controls, blocks, timers and so one. All parents had put some kind of parental controls. However, not all understood the various levels at which this was possible. The technical complexity involved in managing this was something that the parents and teachers in my study were working hard to keep up with. Nikken and Jansz (2014) suggest that using technology-supported safety measures such as anti-virus programs or spam filters, as well as applications that are purposefully designed to protect children's safety are mostly exerted by computer literate parents. Other studies mention "privacy and safety settings for the multiple devices that children are using can be complicated for both parents and children and often involve different operating environments even in apparently similar technologies" (Holloway et al., 2013, p. 19). In my study most had gone through their service provider, some had put additional controls on the devices themselves. None

were aware that it was possible to use YouTube and Google in safety mode. Again this is mirrored in others studies, where parents are reported as struggling with search filters, not being aware of the need to set them up separately on different devices and in most cases not being aware of safety features on YouTube at all (Livingstone et al., 2014). Sometimes, therefore this role ends up being performed as a result of something happening by mistake. At least two parents in my study had suffered financial losses as a result of not having disabled in-app purchases on a specific device and other research reports children accessing online sites inadvertently, straying on to inappropriate YouTube videos or uploading things to Facebook without realising (Marsh et al., 2015).

Although adults often perform this role it was not always the case. Although at home children sometimes ask parents to help when things go wrong or devices are not functioning properly, interestingly, in the classroom it was rarely the teacher who performed this function. In the schools I visited provision and device management were outsourced. In the classroom technical support and device management was delegated to 'computer monitors'; when I questioned them, children put teachers very low on the list of people they would ask for help if their device wasn't working. Zaman et al. also note that technical problems can also lead to "instances of participatory learning when parents and children figured out technical issues together" (2016, p. 16).

Although technical monitoring and control might not seem the most conducive to reflective engagement, my own findings and other studies note a wide range of actual and potential discussions that are sparked in the course of this role. Some of these are more functional - parents engaged in instructive discussions or demonstrations to teach downloading or installation procedures – some are cultural – parents told for example of "justifying or negotiating purchase restrictions such as questioning the investment in a gaming console when they already had a tablet with access to a variety of free or low cost games" (Zaman et al., 2016, p. 17). Interestingly, within the latter interaction is the potential for discussion at a more critical level about how "free" a "free app" is. When there had been a consequence to a specific purchase, like the ones above, this offered an opportunity for reflection on this issue.

In my own study and others, there was cross-over between devices, with for example Bluetooth being used to display on their television the YouTube videos they played on the father's smartphone (Livingstone et al., 2014) or calls coming in on more than one screen. Tom's mum laughingly told me she had never really thought through what the implications of having a Smart TV would be until the children started using it. Here again there is potential for some discussion of connectivity and its implications.

Finally, another 'entry point' that could have been a way in to a wider issue was the password. Across this study adult smartphones were both colonised by children's gaming apps and populated with photos and videos they had taken, often surreptitiously. Although most parents had passwords on their phones, they all said that their child was 'able to get round them'. None had spoken to their children about why having a password might be a useful thing. Conversely Tom specifically showed me how he had created a 'shape password' for his tablet, and explained this was important because he wanted it to be private. Taking about passwords from a young age has the potential to touch on issues of personal space, privacy and security. By focusing on small, but real things like this, conversations could move from functional to more reflective engagement.

Curator/Gatekeeper

As well as managing devices in a technical sense, another role that emerged in my findings is managing content. In studies that use parental mediation frameworks to characterize use, this is part of what is described as 'restrictive' mediation. However, this phrase implies a denial of certain opportunities rather than a positive shaping. I suggest that an alternative way of characterising this therefore would be to describe it as curation and gatekeeping. These are two interconnected but slightly different roles. It is possible that if parents and teachers were described in popular discourse more in these terms they might see their role differently.

As curators, adults narrow the online landscape for children to shape on-screen environments. They do this by pre-selecting apps and websites, setting up

child-friendly interfaces or ways of navigating and creating folders to delineate children's space and content management (Livingstone et al., 2014). As gatekeepers, the added component is that adults assume responsibility for assuring the quality and appropriateness of this content.

As curators I observed or was told of several moments in parent-child interaction where opportunities for reflective discussion could be found. For example, in downloading apps, some specified a limit and encouraged children to reflect on "what they really wanted on there". This could lead to reflection on overload and encourage judgment. Zaman et al. make a similar point in relation to choice of content, noting that parental disapproval did not necessarily result in restrictions, but sometimes led to a discussion focused on the child's judgment (2016). Where folders or bookmarks had been created to shape children's things, the potential was created for discussion of why 'managing data' might be good practice for encouraging balance instead of overload. In contrast, at school it was clear that reflective engagement was in some instances hampered by the messiness or busyness of the screen. Making curation part of classroom practice might have been a good way of triggering a reflective conversation. Finally, given the prevalence of image sharing, whether photos or pages of Google Image results, activities that involved making and justifying choices of images to use for particular purposes might be a fun starting point for discussion. Highlighting some of these triggers to parents and teachers might be a generative way of starting more dialogue.

In terms of gatekeeping, research suggests some adults are confident in this role, finding that although the marketing and buying of apps is a relatively new area for parents to navigate they had twelve clear strategies for choosing apps they thought were appropriate" (Marsh et al., 2015). Other research highlights that the time and knowledge needed to find and evaluate content can be a barrier (Flewitt et al., 2015). In light of this it could be interesting to revisit the use of heuristics, mentioned in my literature review as an increasingly common way of making decisions about trustworthy or appropriate content (Metzger et al., 2010). Marsh draws attention to the way that parents are targeted by the marketing strategies of certain children's content, noting how in certain virtual worlds "sections of the websites are devoted to outlining to parents how interaction on the sites is tightly controlled and monitored in order to allay their

concerns regarding Internet safety" (Marsh, 2010, p. 26) and Nansen et al. remark that "parent trust was connected to particular sites, such as those encouraged or approved by schools (i.e., *Mathletics*), or those that were seen to be official, legitimate or safe, based on them being a known company, requiring subscription, or having an adult moderate activities on them (e.g., *Club Penguin, Barbie*)" (2012, p. 6). Supporting some of the earlier findings reported in my literature review about perceptions of Google, a recent Ofcom report notes that as children start to search for and download more content themselves, their consumption is "increasingly curated by digital intermediaries, including providers like YouTube and Google. As well as attractive sources of content, rivalling traditional broadcasters, they are also seen by some children as legitimating brands, helping to vouchsafe the veracity or trustworthiness of content accessed through their sites" (2015, p. 4). One thing that emerged from my own study was the extent to which the Google Play Store and the App Store appeared to be viewed in a similar way. This finding is mirrored in another recent study by Marsh, who found "the online stores were the sources most frequently used for learning about new apps, stores which are, inevitably, driven by commercial interests" (Marsh et al., 2015, p. 17). This presents some challenges in terms of reflective engagement.

The findings of my study, which are mirrored in others, is that by the age of 7, allowing children to download their own apps is quite common. As we have seen when discussing practices, this is part of a bigger picture of customising and creating that for some is an important part of emergent identity practices, autonomy for which is enabled by the fact that some tablets are children's personal devices. In my own study, devices that were shared were more likely to contain a few apps chosen by parents, whereas devices that were owned by children had several screens worth of apps, which had been downloaded by the children themselves from "free" sources. Other research found that 7 year olds were much less likely to have "educational" apps on their devices than younger children (Chaudron, 2015). This raised interesting questions for me about the age at which curation practices are switching from parent to child, how children are interacting with new gatekeepers and whether this is being supported. Although in my research I caught glimpses of the ways children interacted with the Google Play Store, including the way that seamless in-game advertising

encouraged children to get new games, I felt this was an area that raised more questions than suggested answers. Given the evidence that children are curating their screens from a young age, I would argue there is an urgency to pay more attention to this kind of interaction, and that finding ways to engage children (and adults) in dialogue about gatekeepers, what makes them trustworthy and who they might be, is an important element of encouraging a culture of reflection

Emotional Mentor

In previous sections I have highlighted that most of the tangible consequences of device use in the lives of these children were social and emotional ones. As I found in my literature review, parents in particular are playing a clear role in helping children to manage these affective experiences. Some of the strategies being used to provide emotional support were listening, managing frustration, reflecting back children's emotions to them, resolving conflict and showing the child that their "world" was valued. One parent articulated this: "It's the same with building Lego and stuff like that, I'll sit there and play that with him for hours so why would I not learn what he's doing on that [iPad] to be able to join in. And you can have conversation with them as well can't you, because if that is what their world is at that moment in time".   My findings also suggested it was important that this role is found space for in classroom dynamics, but that it was less prevalent there for logistical reasons. This is mirrored in another study of a pre-school classroom, where children were observed becoming frustrated by not being able to do things, by other children interfering and as a result of vying for possession, but staff lacked the time to help them deal with these situations (Flewitt et al., 2015).

Of interest to the present study is how these instances of emotional support develop into reflective engagement. In their study of 0-5 year olds, Marsh et al. rethink active mediation to include emotional support, observing that one of the main ways parents support children is by "develop[ing] strategies for managing the tablet at times when its use may have been problematic" (2015, p. 24). In that study, specific examples of this involve helping children to be more patient and talking to them about balancing use of the tablet with other kinds of play.

This links back to the findings of Zaman et al. who also note for example that the transition away from device use can be a prompt for light discussion of what makes games so immersive (2016). In my study I saw several similar potential "entry points" to this kind of discussion. For example, emotional support was observed or reported taking place in the context of the transition away from device play (frustration at not being able to keep going), intervening when siblings 'killed each other' in game play, difficulties completing a research task using *Google* and saying goodnight without letting on you are mum and son. It was also absent from the emotional fallout of the friendship dynamics played out through the continued addition and removal of different children from the 'credits' of shared work. In each of these instances there was the potential to make links to discussions about balance and online conduct, for example treating people kindly, protecting privacy and respecting authorship. In her ethnographic study of parental mediation of teenagers, Clark tells the story of one family where reflective engagement emphasised "respecting others and thinking through how your own actions affected the lives and choices of those around you as well as how they affected your own life" (2011a, pp. 22–23). In this instance parents saw themselves as "consultants as the children worked out solutions or next steps" (2011, p. 23). Raising awareness amongst teachers and parents of the importance of emotional support and the part it can play in supporting reflective engagement would be very helpful.

Contextualiser

The discourse of intergenerational difference, where parents report on the fluency or digital competences of their children compared to their own experience, is long-standing (Marsh et al., 2015). It links with established debates about the changing notion of expertise and with research that suggests a less hierarchical role for the parent, who is no longer expected to always take the lead (Clark, 2011b). Marsh found that for 0-5s the main reason for help was "when children were learning to use new apps, or engaging in educational uses of the tablet" (2015, p. 23). Studies of children the same age as those in my study suggest that although parents are still "helpers", guiding children when they used a device for the first time or when they encounter problems (Zaman et al., 2016), their involvement soon decreases as their child becomes more

experienced (Livingstone et al., 2014; Marsh et al., 2015). Even at pre-school age, one study similarly found that "adults were certainly not the only experts in the classroom" and some children were "considered to be 'ahead' of staff with new technologies, 'brilliant at computers' and able to 'teach the teacher'" (Flewitt et al., 2015, p. 13). This potential to "empower 'expert' identities amongst children" is something rightly to be celebrated, but also to be cautious not to over-exaggerate.

In my study, I would argue that it was when I observed more instructional interventions by adults to scaffold reflective engagement that they were the least successful. I interpreted the reason for this to be that these explanations or instructions were decontextualized from children's experience – hyperlinks – or because the 'pedagogical' approach was to suggest a 'proper' way of doing things – Anna's mums guidance on navigation. In contrast, where guidance appeared more successful was where it centred on contextual use, for example in Will's shared exploration of how moderation worked to uphold codes of behaviour in *Clash of Clans*. Belshaw describes "the need to understand the various digital contexts an individual may experience" as one of the essential elements of digital literacy (2011, p. 207). Being able to reflect upon the fact that " a learning platform is a different semiotic domain to games such as *World of Warcraft* or social networks such as Facebook" (2011, p. 207) in his case, and perhaps many other children's, would seem a more relevant issue for reflection.

Research in family literacies often highlights the contextual dimension provided by scaffolding at home, arguing that intergenerational practices are significant because they offer "meaningful opportunities for communication which develop their skills, knowledge and understanding and affective orientations" (Marsh et al., 2015, p. 12). Sometimes this is contrasted with school practices where content is "abstracted from meaningful contexts and world practices' (McTavish, 2009, p. 23). This binary is too stark. Studies show that teachers are keen to develop "a local curriculum and pedagogy that integrates the devices, and supports their creative use" (Flewitt et al., 2015, p. 27), with one teacher quoted as saying '... one of the things we're supposed to teach them in the new EYFS is about the world as a whole and how those children are going to be able to

move into that world and technology that is there for them in the future and it's forever evolving'" (Flewitt et al., 2015, p. 11).

Teachers also need to be more knowledgeable about the digital worlds that are important to children (Sefton-Green et al., 2016). Potter suggests that the key to developing reflective engagement is through dialogue "which opens up reflexivity in their uses of lived culture as a resource" (2013a, p. 79). By having some familiarity with the landscape, teachers can then let pupils be the experts about their own digital practices, and inform teachers about these (Parry, 2014). At least one of the teachers in my study was trying this out, experimenting with using *Minecraft* and using circle time to discuss home use. Helping more teachers and parents to do so could, according to Potter, "contribute things of enormous value, such as critical distance and judgment, the opportunity to stand back and see wider contexts and review contributions to debates in depth" (2013a, p. 80) .

Networks of support

When my study began, one thing that had intrigued me emerging from parental mediation literature was the finding that 7 year old children appeared to be considered too old for 'co-use' in play sense and too young for 'active mediation' in a critical sense. In using 'roles' to characterise different relationships around devices I have found there is potential in a wide range of dialogic relationships to encourage and support reflective engagement between children, adults and devices. In addition, using this framework it becomes easier to look beyond the one-way strategies implied by parental mediation and see the potential for more dynamic and fluid roles to be played within the family and classroom. Whether curating or managing, contextualizing or collaborating, the logistics of life and individual skills and preferences mean that some of these roles might be better shared or delegated across a network of support, something Jenkins describes as "distributed expertise" (2009). Barron et al. identify "Learning Broker" as one of the key roles played by parents. This describes when parents "connected a child with people of experiences that could support learning" (2009, p. 71). By identifying such opportunities, parents contributed to their children's learning even when they did not possess expertise in the field. In their study this refers to specific things like identifying

personal tutors and driving children to visit them. I see this "brokerage" as more fundamental.

In my own findings I found examples of parents relying on a wider circle of family and friends to guide decision-making, for example about connecting children on controlled servers. This finding was reflected in the other study close to my own, which found "extended family members and networks outside the home playing a key role in socialisation and communication" (Livingstone et al., 2014, p. 3). In the wider European context of that study a similar example is found where neighbours were actually co-creating rules about use and game days together (Chaudron, 2015, p. 18). One alternative way of thinking about roles might therefore be to see them not as needing to be embodied by a single person but rather as roles needed within a community.

The obvious starting point in terms of expanding the network of support fpr reflective engagement around children might be the connecting space between home and school. However, in my own study I found few concrete examples of any common space for reflective engagement. In fact in several cases I found instances where reflective engagement sparked by school was because of something unwelcome that originated there. Overall however, parents trusted that school was doing the right thing, they were just not sure what it was. Livingstone et al. also found that schools are "trusted to deliver the needed technology exposure" and that in some cases parents are "taking advice from teachers about suitable apps" (2014, p. 32). Again however, reflective engagement did not go much beyond this with the demand from the school to parents being described as fairly low: "Parents were aware of some of the ways that the school used technology (for a reward, to practise certain skills, via a school intranet) but did not see this as particularly interesting, noteworthy or problematic" (2014, p. 32). In terms of specific conversations, there was little evidence for the efficacy of school briefings, something I also found. As I have argued throughout, many scholars argue the need for more dialogic relationships between the spaces of home and school. I will return to this question in my conclusion.

Resources

Running through the previous sections is the recognition that reflective engagement does need support and encouragement, and that adults need this as much as children. As one recent report claims: "A new generation of parents is emerging who are interested in, and able to, support their children's digital experiences but who are not themselves being supported in this task" (Blum-Ross & Livingstone, 2016, p. 4)

When this study began I felt there was an overwhelming array of models of support, which offered sometimes complementary and sometimes differing views of reflective engagement. In order to guide my exploration I distilled some of these into key elements. Although there were limitations to this conceptual model, it nonetheless provided some useful insights. In particular it highlighted where there were absences or barriers to reflective engagement, where resources were needed. In this final section I will first outline any absences I have not yet discussed and then re-engage with some of the literature to suggest some of these potential resources, which I have categorised as narratives, meta-language and questions.

Absences

Throughout this chapter I have identified moments or gaps where there could be opportunities for seeding reflective engagement. My findings also highlighted two key absences in terms of reflective engagement: visual criticality and commercialism. These findings are consistent with other studies. In terms of critical engagement with images, the latest Ofcom survey found that the least common topic of discussion between parents and children is "inappropriate use of images, either using copyright images or uploading images of self" (2016) whilst a recent survey for the UK Safer Internet Centre found that the majority of young people find it hard to critically evaluate the images and videos they find online: "Despite over two-thirds of 8-17 year olds recognizing that images and videos can be misleading or don't tell the full story, just a third of young people said they find it easy to check if the images and videos they find online are

truthful. Almost half said they are more likely to trust something has happened if they see an image or video of it" (Gardner, 2017, p. 6). This report argues that in a world of selfies, emojis and memes there is a pressing need to support children in critically evaluating images and videos online as these can have a powerful influence on their self-esteem, beliefs and behaviour. These findings complement another study, which found that in the households of 0-5s "none of the parents challenged their children's engagement with stereotypical characters and types of apps" (Marsh et al., 2015, p. 21). In her study of four year olds visual literacy practices, Yamada Rice argues that "learning to 'read' images by osmosis … is [not] the same as having been taught skills to produce, criticise and evaluate visual meaning-making" (2010, p. 344) and yet "little focuses on the visual mode and best practice for teaching visual ways of making meaning" (2010, p. 358). This leads her to question whether children are being sufficiently supported to critically 'read' images as well as print and to claim that "formal frameworks for the discussion and evaluation of multimodal literacy practices need to be considered a priority" (Yamada-Rice, 2010, p. 360).

In terms of advertising or any discussion of the commercialism of the online world, my finding was that although parents could talk about this when prompted, it was almost entirely absent from their own descriptions of what concerned them. This mirrored the findings of previous studies that suggested "these issues remain marginal in the minds of parents" (Nansen et al., 2012, p. 11) and current studies, which like my own found that "parents did not spontaneously talk about specific commercial risks or about an over-commercialised environment, but when it was raised by the interviewer they recognised the concern and could talk about it as potentially problematic" (Livingstone et al., 2014, p. 27). Interestingly, in the latter study this was in contrast to children's own negative views of advertising, based on frustrating experiences with pop ups and in-app purchases.

This lack of concern about commercialisation is one of the most surprising and potentially worrying aspects in terms of where reflection is not happening. From the change in television viewing to commercial on-demand services, to the use of cookies, to educational software packages shaping practices and collecting

data in schools the evolution of the online landscape raises questions about whether young children are being increasingly targeted by commercial interests (Sefton-Green et al., 2016, p. 8). With the Internet of Things, even more data can be collected about children's practices (Manches, Duncan, Plowman, & Sabeti, 2015). Whilst it could not be expected that children take critical responsibility for this kind of engagement, it raises issues about which parents and teachers should be informed.

Unlike with visual literacy, the frameworks for interrogating advertising are already tried and tested within media education (Banaji, 2010), and studies have shown them to be effective even with young children (Parry, 2015). This begs the question of why they are not well-used and invites a return to the curriculum, and parent and teacher time. In terms of some of the newer ways in which children's practices are being shaped by the commercial world, what is highlighted is the need for narratives and resources to make these issues more visible and accessible.

Narratives of "good use"

Narratives can play an important part in shaping engagement. Recent research has argued that "parental anxieties – which are fairly high in the UK, often caused by media panics about smartphone addiction, technological innovation and its supposed threat to youthful innocence … appeared to fuel a lot of talk about technology" (Livingstone et al., 2014, p. 28)). Coupled with this both the previous study and my own found that parents often report not meeting their own parenting expectations, for example in terms of modeling good behaviour. Livingstone et al. highlight the difficulty adults had articulating positive narratives of use: "They had few ideas about which activities, sites or games they wanted to encourage or how they, as parents, could mediate their child's digital activities and engage positively, whether sociably or imaginatively" (2014, p. 30). When parents did outline the benefits as they saw them they were usually in terms of acquiring knowledge or future employment (unspecified) for which IT skills would be necessary. Although in both my own study and others there are examples of parents encouraging device use as part of broader

support for creative talents.

An interesting insight is provided by one study that undertook content analysis of 'screen time' advice for parents across 'official' and crowdsourced platforms (Blum-Ross & Livingstone, 2016). This study found that guidance for parents remains overwhelmingly focused on risk and harm, with only a small minority of sources of advice emphasizing either that "children's use of digital media need not be all negative" (2016, p. 14) or "the opportunities that digital media present to learn, connect and create" (2016, p. 27). The authors conclude: "when parents are told that their only role is to police and to monitor, they are left unsupported in helping their children access the unique benefits offered by the digital age" (2016, p. 4).

In school, at the time this study began, the National Curriculum for Computing – another narrative of 'good use' – was being introduced for the first year. In terms of teachers, those in School 1 all told me the scale of it was overwhelming and they hadn't felt able to engage with it at that point. In School 2, some of the work of embedding 'good use' was being outsourced to commercial educational packages like *Mathletics* and Purple Mash. Although this was not the case with the teacher in that school, the use of commercial software potentially compartmentalizes computing activities. This is of interest because research indicates that many early years teachers "consider ICT as a tool for learning academic skills, not socio-emotional skills" and that there is a lack of understanding of the potential of new technologies to promote early literacy (Marsh, Kontovourki, Tafa, & Salomaa, 2017, p. 9). Teachers too therefore need more narratives of opportunity, to see "the pedagogical implications of ICT for developing children's social skills, participation, creativity" (Marsh, Kontovourki, Tafa, & Salomaa, 2017, p. 9).

All the parents in my study expressed that they would value more guidance (perhaps a reflection of the fact that they were people who had volunteered for the study). However, what they emphasized was that they would like recommendations for positive use in accessible and short forms. Both parents and teachers alike expressed the sense that they would rather find out about things in smaller chunks – a section in the weekly newsletter, a regular but short bit of the staff meeting to discuss a particular issue. This was of interest

because it suggested that it was access to useful narratives as much as narratives themselves that was a potential barrier to more reflective engagement. Blum-Ross and Livingstone agree: "Parents need concrete suggestions for how to use their digital expertise to engage with their children … This should include *curated recommendations* [my italics] for high-quality content, differentiated by age, interest and special need" (2016, p. 29).

Meta language

Some research has argued it is difficult for young children to understand 'beyond the screen' - how things are connected at this age (Yan, 2005, 2009) My findings suggested not that they couldn't understand it – indeed their curiosity for screen iconography and marginalia was an encouraging starting point. Rather the problem was that their exploratory instincts were not always matched with a meta-language that helped them make sense of it. This language is not intuitive; it needs explanation and scaffolding. Media education has long seen having a 'media language' or meta-language to talk about how the media work as one of the key tools for reflective engagement.

In her model of critical digital design Pangrazio suggests two helpful ways we might scaffold young people to engage more critically (2016). First by creating visualisations that might lead to a more practical and in-depth understanding of the architecture of digital contexts. Second, by encouraging analysis of the rhetoric of the online world: "questioning what concepts like free, friend, link, like, community, share, collaboration and open actually represent in the digital context might result in a more conscious and knowing mode of engagement" (2016, p. 173). Whilst Pangrazio's model was developed with teenagers and ultimately geared towards the more critical agenda of questioning the conceptual tools that shape engagement it nonetheless resonates with some of the findings of the present study. Children are already exploring and playing with potential 'building blocks' of reflection: school networks, screen icons. I suggest that a more playful, multi-modal language used to describe and navigate the online world, for example child-friendly designs for the school network, which visualised the architecture of connectedness in a more interesting way could be a fruitful way of encouraging conceptual

understanding. By identifying tools such as the above and tapping into children's curiosity for visual play there is the potential to see 'messing around' differently, and to help it to become a stepping-stone on the way to more reflective engagement.

Questions

One of the common challenges in encouraging reflective practice, as highlighted in my literature review, is finding a way not to ignore the affective or pleasurable aspect of practices (Buckingham, 2007). For support to be meaningful, it is necessary to understand what motivates children and what makes engagement fun or interesting for them. Otherwise attempts to encourage reflection may simply be adhered to. By being more attentive to the affective context it is possible to envisage alternative ways of approaching reflective engagement. For example, it might be possible to tailor **questions** that get more to the heart of some of the issues children are willing and able to get involved in reflection about. As one concrete example of this, I saw no evidence throughout my entire data collection of children engaging with the issue of whether information was true or not. In fact on the one occasion a teacher tried to encourage this kind of reflection it was almost completely unsuccessful. It was not relevant to their reason for looking for information. The only time I observed I observed tenacity for finding a specific 'correct' item to show me was when Anna wanted to re-find an actual dress she had bought. It seemed important to find the 'real thing'. Otherwise, information seeking was experienced in a different way and as an activity could more commonly be described as finding amusing stuff. In this context the question of whether it can be trusted is not relevant. More pertinent ways in to reflection might be to ask: When do I need to check I can trust something I find online and when does it not matter? Or is it a good use of my time to just keep going from link to link? Parry and Potter have both argued that creating space for questions about children's affective responses and lived experience of their digital lives is at the heart of encouraging more reflection (Parry, 2015; Potter, 2013a). In future research it is to these ideas that I would return.

Another argument for the usefulness of asking different questions comes out of the new guidance on "screen time". Here the suggestion is that reflective engagement with screens would be better supported is parents asked both themselves and their children new, more pertinent questions about context, content and connections: Is my child physically healthy and sleeping enough? Is my child connecting socially with family and friends (in any form)? Is my child engaged with and achieving in school? Is my child pursuing interests and hobbies (in any form)? Is my child having fun and learning in their use of digital media? (Blum-Ross & Livingstone, 2016)

This focus on thinking of new, more guided questions is one that could translate into concrete and accessible guidance. More generally, this focus on resources is one that offers much scope for further, more practical research.

Summary of chapter

The over-arching aim of this study was to find ways to encourage and support reflective engagement with online devices in the life worlds of 7 year-olds. In answer to this I feel that identifying practices, spaces, roles and resources as potential "sponsors" of reflective engagement has led to new ways of seeing both where challenges lie and opportunities exist. Leander talks of the "imagined geograph[ies]" of learning – challenging researchers to conceive differently of where learning does or could take place (2010). At the point where this study ends, I see mapping these interdependent sponsors (practice, spaces, roles, resources) as one constructive way of conceptualising how reflective engagement might be encouraged and supported across primary school communities (Figure 4).
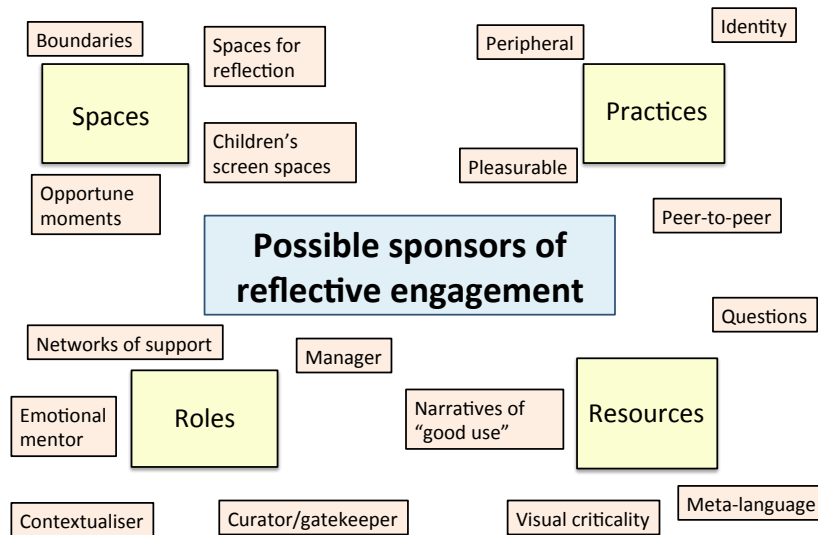
Figure 4: Final map of possible sponsors of reflective engagement

In her vision of possible education futures, Facer proposes the idea of the school as "a mobilizing resource that harnesses and amplifies the potential of a community … to educate its young people" (2011, p. 106). She also presents schools as prefigurative spaces "environments in which communities can model today how they might want to live with each other in the future" (2011, p. 104). As part of this she argues the need to "create a conversation about the socio-technical structures we are building and our responsibilities within them and to each other" (2011, p. 100). Trying to find a pragmatic way of mobilising some of these sponsors of reflective engagement across the primary school community would contribute in a small way towards this goal.

Conclusion

The aim of this study was to identify and generate ways of encouraging and supporting reflective engagement with online devices in the life worlds of 7 year olds. In the course of my research the emphasis shifted from focussing on how adults could support children towards a more distributed view of intergenerational needs and expertise. However, although the framing of my questions evolved over time, its core value remained consistent.

In answering my research questions I have characterised at granular level the practices of 7 year-old children with online devices, situating these in holistic descriptions of their contexts. I have tried to capture the mutual ways in which children are shaped by and shaping of the different spaces and relationships they inhabit with online devices and when, where and how this leads (or could lead) to reflective engagement. I have brought ideas from different disciplines into dialogue and interrogated them to see how pragmatically useful they might be in generating ideas for age appropriate support. Finally I have identified some of the barriers to and facilitators of more widespread reflective practice across the school community.

My conclusion is that creating a culture of reflective engagement needs to be a collective effort. In interrogating the concepts of practices, spaces, roles and resources I have tried to address this by reimagining support in a more fragmented and distributed way. From this I have offered a stimulus for mapping 'sponsors' of reflective engagement, which with some adaptation I believe could be used as a tool for self-reflection in school communities. In this way I believe that this study has practical relevance to ongoing creative thinking trying to find space for an evolved version of media literacy. This is where I hope I have made a contribution to knowledge.

This contribution is timely. The latest Ofcom survey (2016) found that 67% of children aged 5-7 are now using tablets, compared to 39% in 2013 when study began. Of these 32% own their own tablet, another steep increase from the 13% in 2013. Encouragingly there has been an increase in parents talking to

children aged 5-7 about some aspect of their online use, most often the appropriateness of content, with 65% now doing so at some point. On the other hand, it is reported that parents are reluctant to challenge or critique use believing "that they cannot counter the advent of digital media and should, instead, keep up with the changing technology landscape" (Zaman et al., 2016, p. 21). There are notable gaps in what they talk about and many say they would welcome more advice (Chaudron, 2015). At the same time a wide-ranging, national survey (state of the nation report) of school practice has raised questions about the "effectiveness of schools to engage with the ever changing issues that arise in this field" (Phippen, 2015, p. 3). It suggests that over half of staff in primary school have received no staff training about online safety, almost 60% of schools have no engagement with the community on online safety issues and a total absence of "aspirational or innovating practice" in this respect. This is supported by other research that found "advice from schools appeared to be limited, nor did there appear to be substantive communication between schools and families on issues relating to technology" (Chaudron, 2015, p. 9). As I was writing up this thesis, a report by the Children's Commissioner was published (2017), which lamented that the National Curriculum "does not teach the 'social' elements of life online" including "how to critique content, for example, how to assess representations of body image and how other people portray their lives online, how to spot fake news or how to disengage and control one's own internet use" (2017, p. 5). This report called for a broader digital citizenship programme to be compulsory in all schools, "led as far as possible not by teachers but by older children" (2017, p. 5). These were all areas where I felt my research could play a part and could offer opportunities for connecting and interrogating home and school practices.

Practical recommendations

A similar study to my own emerged during the course of my research, conducted by leading experts in this field. Their recommendations for further research chime in part with what emerges from my findings: "to study how parents and teachers could collaborate better towards the common goal of increasing children digital autonomy and critical thinking for a safe and

balanced life" (Chaudron, 2015, p. 29). In particular they articulate the need for 'the development and promotion of communication strategies outlining how parents and schools can together reach the objective of digital literacy of the school curriculum'. In any school community there is a range of expertise and knowledge. Some parents expect school to help, but equally there are many parents who could be in a position to advise school. I would add to this that the same could be said of children. Broadly speaking this could be explored using the following strategies:

- Find spaces
- Build networks
- Distribute expertise
- Understand and inhabit new roles
- Develop collective intelligence
- Curate resources
- Prioritise the visual

Moving forwards I would distil these into the following four concrete practical recommendations:

Develop a self-evaluation tool for schools and link it to locally meaningful CPD

Whilst the curriculum can be interpreted creatively it does not itself offer much concrete encouragement for the kinds of engagement I have identified as important. Giving schools a tool with which to think community-wide about where and how they might embed reflective engagement, would stimulate thinking and identify training needs. This could be something like the 360° Safe tool used to self-evaluate online safety practices. In addition more CPD work is needed at local level, including with teaching assistants, whose role in the classroom is I believe undervalued and under-recognised. The tool could be linked to something like Common Sense Media's "Digital Passport" as a way of offering or could invite any member of the school community to become a "Digital Champion" perhaps along the lines of the UKLA's "Literacy Champion". CPD could innovate by being more intergenerational, and inviting children to show adults alternative ways of doing things. Again this could be linked to an

existing resource, such as the "Digital Leaders" idea, originally a grassroots practice but which is now offered as a supported programme through Childnet.

Explore the potential and limitations of 'transitional' and 'connected' spaces' within school and between home and school where more dialogue can happen

In the school I visited, this space was circle time, but each school will find different places. These could be material (wall displays, corners of the classroom), time-based (show and tell, in my own children's school "family groups'), virtual (blogs, VLEs) and event-based (clubs, specific days such as Safer Internet Day). My personal interest moving forwards is in the potential of school libraries.

Return to media education models and find creative ways to get them back in to the classroom

One of the urgent needs identified by this study was for both adults and children to develop more critical visual literacy. Training in this and wider media literacy, such as talking about adverts, should be available for all teachers and children. However, being pragmatic, the curriculum is not about to change again, so thinking creatively, schools need help to see where these things can be embedded in PSHE, literacy, or generally across the curriculum.

Parents too would benefit from better understanding in this area. Common Sense Media has a range of materials, including Family Tips Sheets, which could be a good model of starting points for conversations, but work is needed at a local level to make things like these things, and the need for engaging with them, more visible.

Work with external producers

Many of the ideas that have interested me over the course of this research have become a reality: Scouts using "digital badges", the ParentInfo website and the Childnet "Digital Leaders" programme are all examples where something I

wondered about, has been put effectively into practice. Many of my recommendations in this respect are already out of date. I will touch presently on how this has affected my thinking about educational research.

One area where my research suggests scope for practical work with external producers is in using the multi-modal language of the screen and its margins, for example in commercial educational software, to encourage more reflective engagement. This could be an interesting thing to co-produce with children, as has been done with other experiments in interface design (Bilal, 2005). Eagle points out how one way in which young children can gain an early introduction to critical literacy is through the design of books which encourage playful exploration of how they are constructed (2012). This could equally apply to any screen-based interaction. One tool that has been developed to attempt something like this is Mozilla's "X-Ray Goggles". More are needed. In one of the schools I visited there was what children referred to as a 'genie' on the side of the screen. One of the lapses of my research was that I never found out what this was. But the memory of it has continued to intrigue me. Perhaps in my imagined version it contains more potential than it had in reality, but that is not necessarily a bad thing if it provokes ideas. Virtual assistants frequently pop up on commercial websites. Why could some kind of 'genie' prompting reflective engagement or asking interesting questions not pop up on the margins of children's sites? Following up on one of the major findings of the Children's Commissioner Report, where lawyers produced a simplified version of Instagram's Terms and Conditions that were accessible to young people (2017), why could this not be the norm? Could there be a more multi-modal version of them that were readable in bitesize chunks? These could similarly appear via a screen genie or helper.

Limitations

In spite of what I think my research can offer, there are also limitations to this study and its findings.

In terms of methodology I have learnt much in the process and there are things I would do differently next time. First of all, given the subject of my study there has been an **incongruous lack of multi-modality** in either my research or my writing. In much of the research I have drawn on, observations have paid attention to a wide range of multi-modal ways of interacting – gesture, gaze, movement and so on. In the case of pre-school children this has highlighted that language is not always the dominant mode of communication and that gestures of encouragement can be more important in understanding interaction (Plowman & Stephen, 2007, p. 19). In research on children's visual practices, the methods have matched the research questions (Yamada-Rice, 2010). In the primary classroom multi-modal observation and analysis has allowed for rich exploration of children's interactions, highlighting song, movement and embodiment as important aspects of around the screen interactions (Bailey, 2016; Bailey et al., 2012; Burnett, 2013b, 2013a). In Bailey's work, the use of comic strips as a method of data analysis and presentation gives value to the children's worlds in their own terms (2017). This was not quite as I planned. Originally I had ambitions for digital scrapbooking as a data collection and analysis tool but this did not come to fruition. Although I used some visual methods with children, they did not become integral. The reasons for this were partly to do with the scale and scope of my data collection, which in retrospect was too ambitious and wide.

Secondly, although my study had taken learning ecology frameworks as a starting point, I nonetheless collected data from only two settings – home and school. Although this was an attempt to gather more encompassing data than previous research on children of this age group (where either one child had been studied in both contexts or several children had been studied only in a home context), by delineating two distinct spaces to frame my research my study could be seen as presenting children's experiences in binary terms. This way of framing has been identified as unhelpful, not only in terms of home/school, but also on-screen/off-screen and formal/informal learning (Bulfin & Koutsogiannis, 2012; Sefton-Green, 2013). To counter this, I would argue that whilst it would have been interesting to have also spent time in some of the other spaces of children's lives (Herr Stephenson, 2013), in my observations and conversations I was nonetheless inspired by approaches such as that of

Burnett, who actively look not only for material and textual but importantly 'connected' dimensions of children's engagements with digital texts (2013b), through reference to other experiences and places. By being purposefully attentive to mentions of car journeys, after-school clubs, Beavers and friend's houses (Herr-Stephenson, 2011) I was able develop my thinking around porous boundaries, transitions and peripheral practices. These are some of the themes I find most exciting in the data and were I to do further research, I would design more explicitly to allow for exploring more liminal spaces.

Thirdly, I think my findings would be of more value if they had involved more **co-production.** In the home, other studies have used methods that involved parents more in the collection (and sometimes analysis) of data (Marsh et al., 2015; Plowman & Stevenson, 2012). Some have suggested the value of engaging parents as researchers, not only collecting but also framing research questions and disseminating the findings (Marsh et al., 2015). I feel my own study would have benefited from a more dialogic process with parents and children. Again, I think the scale and scope of my research design worked against this. In terms of working with schools, I felt that there was a need to interrogate how research partnerships could achieve more sustainable change. Half-way through my study I developed some extra ideas which both the Head and I were both keen to pursue. However, there was an inherent tension. She was rightly wary of relying on an external person and was keen to build capacity across the school. However, we struggled to find anyone with the time to add to their workload by taking on responsibility for extra research.

Finally, although there have been clear benefits to bringing **different types of research** into conversation with one another, I also struggled with the difficulty of not working clearly within one discipline or framework. As a result, my analysis has been at times more diluted.

In addition to these methodological limitations I am mindful of not addressing the social critique that argues "in policy debates over media and industry regulation … much is demanded of parents in the interests of a free market. In other words, it is assumed that the more parents regulate their children's media use, the less governments need to impose top-down regulation on industry"

(Blum-Ross & Livingstone, 2016, p. 7). Whilst admiring the passionate gauntlet-throwing of Livingstone who claims the need for "an ambitious definition of media literacy, which children will fail to meet" in order to argue for "the equitable provision of resources to ensure the social, institutional and technological conditions required to sustain a media literate population" (2009, p. 205), this was beyond the scope of the present study. I am also cognisant of the fact that from a feminist perspective, my research could be criticised for presenting a rather unchallenging portrait of motherhood and household management.

Finally in terms of limitations, this research has given me pause for thought about the nature of educational research and the balance to be struck between reflection and action. One of the strongest findings of this thesis is that teachers, parents and children need space and time for reflection. As a researcher I have had this luxury. However, ironically I feel I may have had too much time to reflect. I have come to think of there being a tipping point, beyond which the ratio of thinking to usefulness is on a downward slope. In his thesis exploring the proliferation of digital literacies, Belshaw suggests "there comes a time when in an environment of flux some guidance and operationalisation of a term (and related concepts) is necessary … this requires the choosing of a point at which to 'freeze' definitions and discussion" (2011, p. 162). With hindsight (perhaps even at the time) I can see several moments where what I had was "good enough" for that point in time. In failing to act on that, I feel I have missed opportunities to learn from some of the challenges I have identified in my research – information overload, the ability to accept being "good enough", achieving balance. In terms of modelling behaviour, my children will remember these years as those when I was constantly attached to a computer. On a professional level, this kind of research does not necessarily fit with the current climate in schools. In the course of my study I became a parent governor at my children's school. In this role I have been confronted with some of the harsh realities of academisation that have at times made me pessimistic about the value of research that seeks nuance, community engagement and anything beyond performativity. Moving forward I see the need to find ways of making research more nimble and of addressing realities like this head-on.

Further research

Just as technology is constantly evolving, so too is research in this field. Since the present study began in 2013, a wealth of research in the areas of digital parenting and early years digital literacy has emerged. Throughout this thesis I have tried to show how my own study speaks to these networks.

In terms of where this research might go next, this study could generate any number of interesting questions and ideas for further work. To name a few, there would be value in looking in more detail at sibling dynamics or children's emergent curation practices or in undertaking a critical analysis of educational software. From a personal perspective, there are three concrete, locally-based, participatory projects which I would be most interested in pursuing to move this work on. First would be an action-research project with teachers and teaching assistants to develop a visual literacy intervention. Second would be an actual "mapping" project, working with a primary school community to identify resources, spaces and roles. Finally, inspired in part by Pahl and Allan's study of a local library (2011), I would be keen to explore the potential of a school library as a hub for curating, hosting and promoting an intergenerational reflection-building project through virtual resources and face-to-face events.

Personal reflections

A lot has happened in five years. When this study began fake news, unboxing videos, datafication, the internet of toys and sharenting were not part of popular discourse. Seen through the digital lives of my own children, then it was *Minecraft*, now it is *Pokemon Go.* In 2013 my son had not even started school. Now he has just turned seven. In writing these chapters I have inevitably reflected on whether what I have learnt during this process has helped me be a "better" parent. One of the many ironies of this process is the amount of iPad time he has had over the last few months of my writing.

In terms of the bigger picture however, I feel even more strongly today than I did five years ago that, as others have long argued, a form of media education should be an entitlement for all (Bulger, Livingstone, & Zaborowski, 2013;

McDougall & Livingstone, 2014; Parry, 2011, 2015; Potter, 2013a) and this is where I hope to continue my efforts.

It was an enormous privilege to spend time with the children, parents and teachers in this study and to be granted such an intimate glimpse of the details of their daily lives. For them I am really looking forward to trying to put some of the ideas they sparked into practice.

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Appendices

Appendix 1: Ethics approval

Graduate School of Education

Certificate of ethical research approval

MSc, PhD, EdD & DEdPsych theses

To activate this certificate you need to first sign it yourself, and then have it signed by your supervisor and finally by the Chair of the School's Ethics Committee.

For further information on ethical educational research access the guidelines on the BERA web site: http://www.bera.ac.uk/publications and view the School's Policy online.

READ THIS FORM CAREFULLY AND THEN COMPLETE IT ON YOUR COMPUTER (the form will expand to contain the text you enter). **DO NOT COMPLETE BY HAND**

Your name:	**Georgina Tarling**
Your student no:	**620032874**
Return address for this certificate:	**24 Fords Road, Exeter, EX2 8ER**
Degree/Programme of Study:	**PhD**
Project Supervisor(s): Debra Myhill	**Dr.Judith Kleine Staarman: Professor**
Your email address:	**gbt203@exeter.ac.uk**
Tel:	**01392 208753**

I hereby certify that I will abide by the details given overleaf and that I undertake in my thesis to respect the dignity and privacy of those participating in this research.

I confirm that if my research should change radically, I will complete a further form.

Signed:…… *[signature]*   2nd December 2014

Certificate of ethical research approval

TITLE OF YOUR PROJECT:

Making "good" use of the internet? How use of the online information is shaped for 7 year olds by the home and school contexts

1. Brief description of your research project:

This is an exploratory qualitative study looking at the ways in which 7 year-old children use web-connected devices to access and create information and how this use is mediated by their families and schools. The study will take place both in children's homes and in their classrooms and will also involve talking to parents and teachers about the ways that they mediate web use for their children.

2. Give details of the participants in this research (giving ages of any children and/or young people involved):

This will be a multiple case study involving between 8 and 16 children from 2-4 primary schools in the Exeter area. Once I have ethical approval I will approach a range of schools in Exeter to negotiate access to Year 2 classes. I will then approach all parents in these classes via the school to negotiate access to home contexts.

Give details (with special reference to any children or those with special needs) regarding the ethical issues of:

3. informed consent: **Where children in schools are involved this includes both headteachers and parents). Copy(ies) of your consent form(s) you will be using must accompany this document.** a blank consent form can be downloaded from the GSE student access on-line documents: **Each consent form MUST be personalised with your contact details.**

My study requires a strategic sample of schools, including as a minimum, one where internet use is well-established and another where it is less so. As the study will focus entirely on a particular year group and my hope is for the relationship with these class teachers to be collaborative, it is crucial that consent is obtained not only from the head-teachers but also the individual teachers involved.

My study also requires a diverse sample of families. Similar studies to mine, whose depth and richness have depended on gaining the trust of families over a sustained period, and therefore taking up more family time, have offered small incentives as part of their recruitment (Chaudron, S. (2015), "Young Children (0-8) and Digital Technology: A qualitative exploratory study across seven countries". EU: Joint

Research Centre; Stephen, C., McPake, J., Plowman, L. and Berch-Heyman, S. (2008) "Learning from the children: exploring preschool children's encounters with ICT at home". *Journal of Early Childhood Research*, 6(2), 99-117(Stephen et al., 2008). I therefore intend to offer a £10 Amazon voucher to families who agree to participate over more than once visit.

The initial stage of the study is a questionnaire to all parents of the children in these Year 2 classes. This will also provide an opportunity to explain the project and give parents the opportunity to contact me if they prefer their child not to be included in any specific observations. I will therefore be using parents rather than children as the first point of contact. However, I am concerned that parental acceptance of my invitation should not be used in lieu of the informed consent of the child. It is crucial to my study to try and find appropriate methods for accessing the perceptions and life-worlds of young children and negotiating consent with them is part of this process.

The BERA guidelines make clear that participants should understand both the purpose of the study and the research process involved. Informed consent means that making sure that participants understand why their participation is necessary, how it will be used and how and to whom it will be reported. Due to the very young age of the children I am intending to engage in the research process, special consideration needs to be given to the way in which informed consent is explained and acquired. I have considered the following factors:

- How to facilitate children's understanding of the study and what it involves – in terms of language and presentation (Alderson, P. (2003) "Ethics" in Fraser, S. (ed) *Doing Research With Children and Young People* London: Sage)
- How to acknowledge the various contextual factors that might persuade the child, against their will, to participate
- How to ensure that consent is not seen as a one-off event (Hill, M. (2005) "Ethical considerations in researching children's experiences" in Greene, S. and Hogan, D. (eds) *Researching Children's Experience: Approaches and Methods* London: Sage)

In the light of these issues I propose to do the following:

- Prepare A5 leaflets describing the project in very simple language and pictures (prototype attached) (Alderson, P. (2003) "Ethics" in Fraser, S. (ed) *Doing Research With Children and Young People* London: Sage)
- Arrange a pre-research visit for the sole of purpose of going through the leaflet, describing the project, explaining what consent means and allowing time for questions from either the child or the parent (Alderson P. and Morrow V. (2004) *Ethics, Social Research and Consulting with Children and Young People* Barnardos: Ilford)
- Leave time for child (and parent) to reflect before making decision
- Use the leaflet on every visit as a way of re-negotiating consent

In terms of my personal conduct, the literature on researching with children has made me aware that I will need to be alert to:

- Finding a balance between "fully informing" the child and overloading them with information so they become confused or bored (Gallagher, M., Haywood, S., Jones, M.W. and Milner, S. (2010) "Negotiating Informed Consent with Children in School-Based Research: A Critical Review" *Children and Society* 24 pp 471-482)
- Finding a way of making it alright for children to say they don't want to do something without feeling they are letting me/their parents down (Gallagher, M.

et al. (2010) "Negotiating Informed Consent with Children in School-Based Research: A Critical Review" *Children and Society* 24 pp 471-482)

Some researchers refer to the concept of *process assent*, which means being constantly mindful of how children respond to the research situation and altering course accordingly. One suggestion is the use of a "smily chart" as a way of allowing children to their feelings about how participation in the research is going (Dockett, S. (2009). *Engaging young children in research involving children and young children in research: A compendium of papers and reflections from a Think Tank co-hosted by the Australian Research Alliance for Children and Youth and the New South Wales Commission for Children and Young People*. 11 November 2008 pp. 52-63)

In addition to all of this I believe, along with others, that real ethical practice is characterised by reflexive thinking and I will therefore follow the suggestion made in the BERA guidelines to use "ethical record keeping" throughout the entire process.

4. <u>anonymity and confidentiality</u>

In accordance with BERA guidelines and the Ethics Policy of the Graduate School of Education, I will ensure that all participants are offered the right to anonymity and non-identifiability, I understand that if I should collect data on identifiable individuals then they must be given in writing the following data protection notice in a font that is not too small:

> "Data Protection Notice - The information you provide will be used for research purposes and your personal data will be processed in accordance with current data protection legislation and the University's notification lodged at the Information Commissioner's Office. Your personal data will be treated in the strictest confidence and will not be disclosed to any unauthorised third parties.   The results of the research will be published in anonymised form."

Any data I gather will be anonymised using either a number system – Participant1 etc - or a pseudonym system (where children are offered the chance to choose their own names as a way of helping them what is meant by anonymising their data). All audio recordings, transcripts, video footage will be stored under these anonymous file names so that participants are not traceable.

I recognise that participants should be guaranteed confidentiality in terms of what is done with the data collected about them. At the same time I am aware that both the University of Exeter and my funding body, the ESRC, support the RCUK position that "publicly funded research is a public good that should be made openly available to the public when legally, commercially and ethically appropriate" (University of Exeter Open Access Research and Research Data Management Policy).
All participants will be made aware that the data collected about them will be used to compile reports for both academic and non-academic audiences. I will indicate the possibility that in anonymised form, the data may be made available to other researchers in the field in order to produce more comprehensive analyses. I will give participants the option to opt-out of this use of their data.

5. Give details of the methods to be used for data collection and analysis and how you would ensure they do not cause any harm, detriment or unreasonable stress:

Informed by literature on research with young children and the internet I am hoping to use the following data collection methods:

IN THE HOME

- Parent **semi-structured interview** (audio recording) and mapping activity
- **"Home hardware" tour** /mapping activity – child shows me where any internet connected devices are kept in the house and where they themselves would typically use them (audio recording of tour with child also possibly taking photos on a digital camera)
- **Observation and "show and tell" sessions** on the internet – child (with or without parent depending on what their normal practice would be – although I will give all children the option to have their parent present if they prefer) shows me the kinds of activities they would typically engage in on the internet and talks through what they are doing (video recording of session or capture by screen-casting)
- **Experience sampling using mobile phone diaries –** this method would involve me sending text "prompts" at specified intervals requesting parents to send me a snapshot of recent activities either as a video, photo or message made in collaboration with their child. THis is informed by work done in the homes of young children by Plowman and Stevenson ("Using mobile phone diaries to explore children's everyday lives" *Childhood* 19(4) pp 539-553) and Eagle ("Learning in the early years: Social interactions around picturebooks and digital technologies" *Computers and Education* 59(1) pp 38-49)

IN SCHOOL

- **Questionnaire** administered by teacher in class
- **Teacher semi-structured interview and classroom/school "mapping"** – both in offline and online forms (I.e. class page on virtual learning platform)
- **Classroom observations** focusing on case study children and their immediate peers
- **Focus group conversations** – these will either be reflections on recent class activities or evaluations of web content
- **Teacher mobile phone diary –** as above, this will involve me sending prompts at specified intervals requesting some short feedback about memorable recent events

The ethical issues that I need to address before undertaking these methods are the following:

- How do I establish trust?
- How do I ensure that I don't invade children's (and adults') privacy?
- How do I avoid asking children to do something that is too difficult for them?
- How do I ensure I don't overload visits, making them tiring or stressful?
- What is my procedure in case child discloses use of an inappropriate site?
- What is my procedure in case children inadvertently come across inappropriate web material during the research process?

The main way in which I aim to ensure that none of these methods causes harm, detriment or unreasonable stress is by allowing time before the actual data collection begins to meet and discuss the logistics of the process with the parents and children involved. So for example, I intend firstly to write to parents giving details of each data collection method and then to arrange a meeting where any issues are discussed including, for example, the length of time that parents feel is appropriate for any single visit. I anticipate that one way of addressing the above issues is to try and avoid rushing things or cramming too much into a visit. Following Stephen et al. (*Journal of*

Early Childhood Research, 6(2) pp 99-117) I envisage several rounds of data collection in the home which will allow for two things; firstly, it will allow time for a relationship of trust to build between myself and the families, secondly it will allow data collection to respond to emerging issues.

My choice of research methods themselves is ethically informed. My intention, as far as possible, is to use methods that allow children's perspectives to come through. With this in mind I am building on recommendations from the large-scale EU Kids Online project, which suggests that an effective technique with young children is "showing and telling" with digital media. I am also inspired by the Mosaic approach, which involves children in the creative mapping of their own experience. I am also suggesting that some of the data collection be done via the use of mobile phone diaries. This method has been successfully used by other researchers working with young children at home and is seen as being a way both of capturing a more naturalistic picture of their activities, but also a less intrusive one, as it is done by the parents without the researcher being there.

Once I am actually engaged in data collection I intend first of all to give the children the option to have their parent present at any point. Once we start I will make regular checks with the children to see if they are happy with how things are going. I will trial having some visual prompts (cards with different pictures on them) that children can use to give me messages like "I'm tired now" or "I don't understand this". In the school focus groups, I will use the same resources. Given the age of my participants I expect most children at home to want to use the internet in the presence of their parents. Therefore, I think the chances of them disclosing inappropriate use are very slim. However, in both contexts I intend to say to the children before we do anything that if anything comes up that I think is not safe I will stop what we are doing and talk to them and their parents or teacher about it.

Another potential problem is the eventuality that children might come across inappropriate material in the course of the research process. Firstly I need to stress that I see this as being highly unlikely, given the contexts in which children will be "showing and telling" using web-connected devices. However, this is a delicate ethical issue as part of my research focus is to ascertain the ways in which parents and teachers "frame" use of online information, part of which involves the levels of technical filtering in place, the levels of e-safety information they have given children and the ways they respond to online information issues.

My thinking about this has been informed by extensive literature on the subject, which suggests that for the age group I am studying, the kinds of risk I am most likely to encounter will be either commercial or low-level issues of conduct. These are of a different order to the more high-profile risks often associated with the internet such as cyber-bullying or access to inappropriate content. The latter, should I come across them, are clearly things that would need reporting and would end any session I was involved in; the former are arguably incidences that bear documenting, talking about and analysing. The advice from the leading experts on e-safety in the UK also generally suggests that exposure to low-level risk and follow up conversations about how to deal with it are far more likely to develop children's resilience than avoiding the risk altogether.

My strategy therefore, is that, prior to any "show and tell" I will have a conversation with the appropriate adult where I explain that, should such an issue arise, if they are present I would prefer to see how they respond. If they are uncomfortable with this, I think it is appropriate that I have a conversation about developing resilience to online risk with them and include this as part of my data collection. If I am the only adult present with a child/children when this happens I will follow the same procedure I would with my own 7 year old daughter, initially responding with a lightness of touch by

navigating away and then mentioning in a matter of fact way that very occasionally we might come across things we don't like (just as we might in the offline world). I would obviously also gauge the level of distress caused before continuing. However, research suggests that much online risk is not accompanied by harm, so I do not want to make the automatic assumption that such an incident would be harmful to a child, as making too big an issue of it could potentially make it worse. Before the end of the session I would invite the parent/teacher to join us for a discussion about the existence of undesirable material and appropriate levels of response should this happen again (i.e. how to report content). On a more general level, I am ethically uncomfortable with the idea that I should spend time with families without ultimately leaving them in a better position to navigate e-safety issues. Where it is necessary/appropriate therefore I will share my knowledge about these issues with the family before leaving the home setting.

In the school context, I have also considered two more ethical issues. Firstly, to ensure confidentiality I will ensure that I am not passing data from one setting to another. Although ultimately I hope to use my findings to inform resources and/or pedagogy for improving online information literacy across contexts, I understand that my findings can only be used in a general way and that no specific data about pupils in their home context can be shared with teachers. I also need to be mindful of not giving undue advantage or disadvantage to particular pupils. Again I think this can be addressed by the final stage of my project where I use my findings in collaboration with my teacher participants for the creation of resources, which are of specific local as well as more general value.

Most of the data I gather will be in the form of audio or video recordings, which I will then either transcribe or code directly onto video using NVivo 10. There will also be visual data which I intend to use in part as a stimulus for further reflection with my participants, but also which I will analyse using content analysis. I intend to use a combination of inductive analysis, interaction analysis and multi-modal analysis to present "thick description" of my case studies.

6. Give details of any other ethical issues which may arise from this project - e.g. secure storage of videos/recorded interviews/photos/completed questionnaires, or

In terms of data storage, there is the potential for me to have data in the following forms:
   • Video footage
   • Audio footage
   • Virtual data – transcripts, screencasts
   • Hard data – drawings, diaries (at a future date)

The issues I have considered therefore, in terms of storage are the following:

   • Any hard data (interview notes, drawings, video tapes) will be kept in a lockable storage box in my house
   • Anything containing identifiable names (consent forms) will be kept separate from the data collected
   • I will keep two copies of any virtual data – one on the hard drive of my personal computer and one on an external hard drive
   • I will develop a consistent strategy for naming virtual data and file names will not include anything identifiable
   • A list of participant names and their corresponding anonymised forms will be kept separately
   • I will make sure that my anti-virus and firewall are kept up to date and that I have a strong, regularly changed password

7. special arrangements made for participants with special needs etc.

It is not my intention for this pre-pilot to intentionally seek out any child with special needs to participate. Having said that I would welcome involvement from any child with special needs and am keen that my procedure be accessible to all. With this in mind, I intend to acknowledge clearly in my introductory letter to parents that I will make arrangements to accommodate any child with special needs who would like to participate. If anyone comes forward I will liaise with the child's parent and/or support worker to find ways to adapt the procedures.

8. Give details of any exceptional factors, which may raise ethical issues (e.g. potential political or ideological conflicts which may pose danger or harm to participants):

This form should now be printed out, **signed by you on the first page and sent to your supervisor to sign. Your supervisor will forward this document to the School's** *Research Support Office* **for the Chair of the School's Ethics Committee to countersign. A unique approval reference will be added and this certificate will be returned to you to be included at the back of your dissertation/thesis.**

N.B. You should not start the fieldwork part of the project until you have the signature of your supervisor

This project has been approved for the period: **until:**

By Judith Kleine Staarma …   **date: 02/12/2014**

N.B. To Supervisor: Please ensure that ethical issues are addressed annually in your report and if any changes in the research occur a further form is completed.

GSE unique approval reference:…………………………………………….

Signed:…………………………….
………………………………..date:………………………..
Chair of the School's Ethics Committee

Appendix 2: Initial letter to schools

Dear [INSERT HEADTEACHER NAME]

I am writing to ask whether you might be interested in participating in an ESRC-funded PhD study of 7 year olds' internet use that I am conducting at the University of Exeter. The objective is to explore what constitutes effective web literacy provision, and the results could be of great value in the context of the new National Curriculum for Computing and Ofsted's requirements regarding e-safety.

The study is designed to elicit a really detailed picture of how 7 year olds perceive and use online information and how their habits are formed by what they do at home and what they do at school. I am interested in seeing the different and similar ways in which home and school introduce and manage internet use, the extent to which children respond to being "taught" how to use the internet or just "pick it up" and the kinds of discussions those around them (parents and teachers) engage in (or not) about what online information is, where it comes from and what gives it value.

Ultimately my aim is to explore how teachers and parents can work together to encourage healthy and reflective use of online information in young children in an age-appropriate way. I am focusing on 7 year olds, as there has been relatively little work on children under 9, and work on older children suggests that they become resistant to being "taught" how to use the internet because they "already know" how to do it.

I am hoping to recruit four primary schools in Exeter and four families from within each school to take part. I believe the research will have most value if the participating schools and families represent diversity in their use of (and confidence with) technology. The most important thing is that participating schools share an interest in exploring issues around web literacy and are willing to help get parents involved in the process.

I am looking to work with children, teachers and parents from Year 2 or Year 3 and the study would involve me spending time both in the classroom and in selected family homes. In terms of teacher time commitment, the research will predominantly take place in the course of normal teaching, although I will require an initial interview with teachers to get some contextual information and plan the most appropriate times to undertake observations. My plan is to make contact and do the preparation for the project with those involved before February half term, and then to conduct my research on and off until the end of the academic year.

If you are interested I would be delighted to hear back from you once the first few days of term have settled down. If not, I would also really appreciate a line or two of explanation, as this is very helpful information for my research.

Yours sincerely

Georgina Tarling

Appendix 3: Initial letter to parents

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Dear Parents

Would you like to know more about how to help your child cope with the online world as they grow older?

Could you spare a little time to help with a study of how schools can work with parents to help children develop healthy online habits?

Between now and July I will be working with [INSERT NAME OF SCHOOL/TEACHER] to explore the different ways children learn about going online at home and at school. Some of your children may only be in the early stages of going online at home, but what interests me is how they pick up different habits by watching, talking and playing with different people from a young age and the role school plays (or could play) in encouraging good online use.

I therefore need your help. I would like to find **families who would be prepared to let me visit them for an interview and a couple of fun activities with their children** to learn about how online technology fits into their lives at home and their views on how it is used and taught at school. In the first instance this would simply involve an initial meeting to discuss the project. For those who agree to participate further I am offering a **£10 Amazon voucher**.

All the data I collect for the project will be **confidential** and not shared directly with school or anyone else. When I write it up, it will be in the form of **anonymous** portraits of how children learn about the online world. At the end of the project I will be using my findings to hold an Exeter-based event promoting good online use and creating resources to help schools work better with parents around online issues.

If anyone is interested in finding out more, you can contact me directly using the email address below. I will also be available in school on {INSERT DATE] to answer any questions you might have about the project.

Many thanks in advance

Yours sincerely
Georgina Tarling
gbt203@exeter.ac.uk

Appendix 4: Letter to parents about focus group

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Dear Parent

You may remember from previous letters that I am currently working with Miss Stevens on a study I am doing at Exeter University about how children use the Internet. As part of this I would like to talk to a group of children in Otters to find out what they do and don't understand about what the Internet is. This will take 45 minutes and will be done in a small group as part of their normal ICT lessons. I will be making an audio recording of the conversation and using this to inform my study. However, your child will be completely anonymous and all the data I collect will be confidential.

If you are happy with your child being part of this focus group I would be grateful if you could sign and return the slip below.

Thank you very much in advance – I believe that by listening to children we can make sure that what we do in school really matches their needs.

Georgina Tarling
gbt203@exeter.ac.uk

…………………………………………………………………………………………

I consent to my child taking part in a focus group as part of the study 'Year 2 children and the internet'. I understand that:

- They can withdraw at any point (during or after the discussion) by telling the researcher they don't wish to take part
- The information they give may be used in publications or presentations related to the project
- They will not be identified in any way
- The information they give will be confidential

NAME OF CHILD
    ……………………………………………………………………….

SIGNATURE OF PARENT
    ……………………………………………………………………….

DATE
    ……………………………………………………………………….

Appendix 5: Children's consent form

CONSENT FORM (this is the place where you show me if you're happy to take part)

The researcher has explained to me what this project is about and what she is going to do. I understand that:

I can decide to stop taking part at any time just by asking or showing an "I've had enough" card

I can ask for my parent/guardian to be with me at any time

The researcher will keep anything I say private

When the researcher writes or talks to people about this project she will not use my real name or any other real details about me

I am happy to take part in this project

Signed
Date

Appendix 6: Home visit prompts

Offline tour

Warm up – Daily clock
Put down daily clock and lay out cards – use stickers for different people?

- What do you normally do when you get home from school?
- Do you have any favourite toys, books, magazines?
- Do you have any hobbies/sports?
- What do you like doing with your friends?
- Is there anything you like (doing) a lot? Why?
- Is there anything that you don`t like (doing)? Why?
- And what about your family? What kinds of things do you do together?
- Do you sometimes watch films/TV together with your family? Where?

Home tour

Can you show me round the house and show me (take photos of) where you like playing with different things and who you play with them with – also, where other people in the family use devices

- **Which** devices do you have in the house?
- **What** do you like to use them **for?**
- **When** do you use it? Do you use it a lot?
- **Why** do you like it here?
- Would you do this **on your own** or with someone else?
- Does **mum or dad** usually watch you? Do it with you?
- Do **mum and dad use devices** at home? What for? Do you see them doing it?
- Are there **rules** – how long, what you're allowed to do? Timers, charts?
- Do you have to ask to do this? Anything you're not allowed to use/do?
- Do you ever take/use any of **these outside the house**? Car? Friends? Library?
- Do your friends have the same kind of things? Same rules?

- Do you ever use any of these for **school work**?
- Is there anything you've learnt at school that you do at home?

Lego People Map

Look at all the characters and make a ladder/tower/map of who helps you a lot, a bit, not at all.

Sample of pictures

TEACHER

MUM

DAD
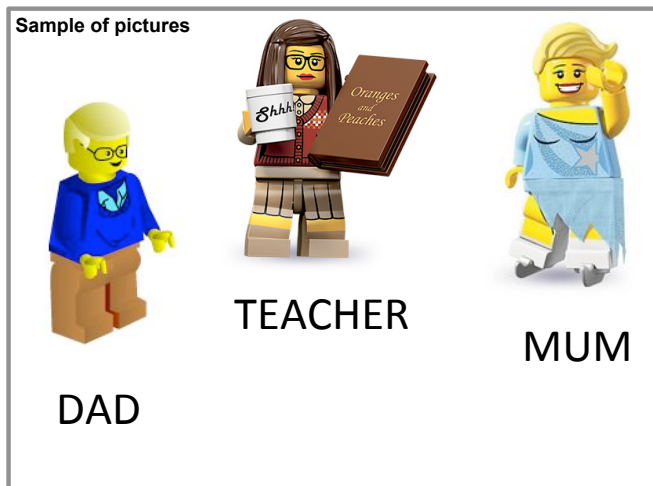
Prompts

- How does X help you?
- Who are you most likely to ask for help at home?
- If you were stuck at school who would you be most likely to ask for help?
- Who knows the most about using the internet/computers?
- Do all these people have the same rules?
- Do you think these people think the internet is a good or a bad thing?
- What kinds of things do they do online?

Emotion words

Pick out the three words that most describe how you feel about the internet

OK   Boring   Difficult

Useful   Fun

Interesting   Frustrating

Easy   Funny

Helpful   Exciting

Online tour

What you like doing

What's your favourite device?
Where would you usually use it?
Who with?

Can you give me a tour of the things you might do with it?
Why you like them and what you know how to do

- What does this do?
- How did you find out about this? Who gives you ideas about interesting things to do?
- Do you talk to your friends about this kind of stuff? Wider family
- What do your friends do? What have they shown you how to do?
- What kinds of things are you allowed to go on?
- Anything you're not allowed to go on?
- How did you learn to do this? Who showed/taught you how to do this?
- Do you mostly use apps or websites? What's the difference?
- Is this online? Are you online at the minute? Are you on the internet?
- Do you ever use the iPad/computer to search for things? What sort of things?
- Which sites are the most useful for finding things out? How easy or difficult?
- Do your mum and dad ever go on these with you?
- Do they help you? (Homework, finding stuff out, games)
- Do you ever show them stuff you're doing/making?
- Do they ever show you new things you could do online?
- Would you like them to do more of something? (e.g. showing more cool stuff, play with you more, ...
- Can you remember any times when you've looked stuff up at home for school?
- Do you like making stuff?
- Do you ever use computers at home to make stuff?
- Have you learnt anything about how computers work? How to make stuff? Programming? Do you use it at home?
- Have you got anything 'saved' on here?
- Is there anything on here that you go back and look at - photos, stories, PPs, dressing up dolls?

Doing something with parent – inc artefact trajectory

- Have you ever made something at home and taken it in to school?
- Have you ever started something at school and brought it home?

If so, using the object as a starting point, ask child and parent to talk about how it was made, why they did it, how they helped each other, who did what

[Potentially I can then also ask the teacher what they did with it in class, how it was shared etc]

If this has never happened, an alternative to this activity could be one of the following:

- Ask the child to show the parent something they have learnt/done at school and observe the interaction
- Ask the child/parent if there are things they would like to show from school or do at home to take to school

Appendix 7: Parent semi-structured interview schedule

GENERAL
- Can you tell me what your child (children) does during a typical week?
- Does your child have any favourite toys, books, magazines?
- Does your child have any hobbies?
- What does your child like doing with his/her friends, etc.?
- Is there anything that your child doesn`t like (doing)?
- Do your children play or do other things together?
- Are there any things that your children does with one parent (but not other)?
- What kinds of things do you do all do together (the whole family)?
- Compared to other toys, books, etc - how much do you think your child likes/uses technological devices

DEVICES
- What devices do you have in the house? Who do they belong to? Where are they kept?
- Which ones does child use (or try to use)? Which is their favourite?
- Are there any (connected) devices they can't/are not allowed to use?
- How long do they use them for? Who with?
- At what age did they start using it? How did they learn to use various devices? Did anyone teach them?
- Does your child use devices on car journeys or other out-of-home/in-between times – what for?

ONLINE
- Does your child go online at home? What for? Which device?
    - Does your child play any online games? Which one(s)?
    - Does your child use the internet? What for?
    - Do they watch TV using an on-demand service – iPlayer, Netflix etc. Can they access this themselves? Using what device?
- What are their favourite websites/apps? Why do you think they like them?
- Does your child take pictures, record videos or sounds with devices? Do they or you share them or upload them on the internet?
- Who downloads/uploads things? Does he/ she ever ask you to buy specific songs or upload a specific video and if so, can you give me an example?
- Do you think your child understands what 'being online' means?

RULES/SUPERVISION
- Do you have parental controls installed on laptops/ computers?
- Do you use the safety mode features offered by Google/YouTube?
- What rules do you have about what they are and aren't allowed to do?
- Do they accept these rules? If not, how do you deal with it?
- Are digital devices part of the 'reward-punishment' system of the family?

- How do you supervise them? Do you sometimes sit with your child/ren while they go online? Or just stay nearby to keep an eye on what they do online? If so, why?
- What kind of conversations have you had with them either about safety, good use or just how internet works? Age appropriateness, adverts/pop-ups etc? Do you talk to child to try to guide what they might do online? Are there particular things you encourage child to do or explore online?

JOINT MEDIA ENGAGEMENT
- Are there activities that you and your child do together online? Why (do you perform these activities together (and not others)? Do you ever play on devices with child?
- Did your child teach you anything about how to use a device? Where do you think this knowledge comes from?
- How do you choose the games/ apps to download to the tablet/Smartphone?
- Do you use any digital technology to encourage, stimulate, and/or educate your child?
- How effective do you think you are in doing this (e.g. is it hard to find the time, or do domestic tasks or other children make your efforts difficult)?
- If your child asks a question to which you don't know the answer what is your usual response? What suggestions do you usually make to your child about finding the answer?
- How confident are you that you can help child develop good online habits?

SCHOOL
- Are you happy with what child does online at school? How much do you trust school to be teaching good online habits? In your opinion what (if anything) should school be teaching your child in terms of using the internet? Whose responsibility do you think it is to teach your child how to use the internet?
- Can you think of any instances where safety advice from school has had an Impact on family practices – or where it has sparked a conversation?
- Are you aware that in theory your child is now learning programming at school – have they mentioned this? Had any impact on what they are interested in doing? Is this something you would ever do with them?

VALUES
- Do you feel that your child gets any positive benefits from using online technologies? Which ones? Why?
- What would you say is positive content for children?
- How useful do you think the web is at this age for children's learning?
- Do you think that your children`s use of (online) technologies interfere in any way (positive and/or negative) with family life?
- Do you have any worries or concerns about your child using these technologies? Or about the use of new technologies at home? Now? In the future? At what age do you think you will be more concerned? Why? If you do, what do you do about it?
- Is there anything else you would like to add that we have not talked about?

Appendix 8: Teacher interview schedule/guidelines

SCHOOL BASELINE DATA

- Do you have e-safety policy?
- Acceptable Use Policies?
- Does school have a VLE?
- Is digital literacy/computing centrally managed?
- Have KS1 teachers had any CPD on the NC for Computing?
- Have you (the school) done any e-safety presentations (or other initiatives) for parents?

TEACHING OVERVIEW

I'd like to get your perspective on any direct or indirect teaching you've done in terms of online use.

Direct teaching
Prompts
- Does your Year 2 class ever go online in class?
- Do you ever ask your Year 2 children to go online as part of their home learning?
- Have you done any kind of e-safety teaching with your Year 2 class?
- Have you done any kind of teaching regarding how to make judgments about the quality of online information?
- Do you use a scheme of work – how does it fit with overall curriculum
- What resources/activities do you use
- How often
- Acceptable Use Policy
- When and how (often) are rules for use established
- Specific opportunities created for children to debate/reflect on use of online (information) in the classroom - conversations
- Balance between e-safety and critical skills
- Have you ever had a direct discussion about what the internet is?

Indirect teaching
Prompts
- Incidental ways in which children's reflection on online information is challenged/provoked in the classroom – conversations that come up

MAP

This is about getting a **sense of your classroom and how online use fits in/indirect ways that you might give messages about online use**.

- Where any of the devices are that you might use for going online (how often would they come out)
- If there are any visual references to online use in the classroom – posters, instructions, whiteboard, acceptable use policies – permanent/temporary (ie film viewed on whiteboard)

- Does your classroom have any kind of online presence – class blog, class page on VLE?
- Does your class have any virtual 'links' with outside world - ie blogs that receive comments?
- How often is the classroom "connected" / online?
- What kind of thing do you go online for? What is the default page when they log on? What search engine do you use?
- How is your classroom "connected" to home? What are the communication channels? Are any online?
- What 'message' would you say the classroom/school environment gives about the role of online world in children's learning?

PERCEPTIONS/UNDERSTANDING OF HOME USE

This activity is to get a sense of how much you know about/your perspective on **what children do at home**

- Do you know of any activities that the children in your class do at home?
- Do you ever have conversations at school about what they do at home?
- Do you ever incorporate anything they do at home into class activities?
- Do you have any contact with parents about online use?
- How well do you think you understand the kind of things your kids do online at home? How much opportunity is there for children to bring home habits into the classroom?

Appendix 9: Certificate of Participation

Certificate of Participation

This is to certify that …………………………………………………………………

has taken part and been very helpful in the PhD research project 'KS1 children online at home and at school'

Signed   ……………………………………

Date   ……………………………………

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Appendix 10: Attempts at visual portraits

How are your devices connected?

What journeys do your devices go on?

Where do you most enjoy using them?
HOT AND COLD /OTHER EMOTIONAL COLOUR CHART

Where do you mostly use specific devices?

SCHOOL
PC
Netbook
XBox
GRANDPARENTS
CAR
Mum's phone
MUM AND DAD'S ROOM
iPad
iPad
iPad
Figures
Board games
BEDROOM
KITCHEN
Lego
XBox
iPad
SITTING ROOM
Laptop
XBox
FRIENDS HOUSES
Wii
Mum's phone
LIBRARY
AFTER SCHOOL CLUBS

SCHOOL
PC
Netbook
XBox
CAR
Mum's phone
MUM AND DAD'S ROOM
iPad
iPad
iPad
Figures
Board games
BEDROOM
KITCHEN
Lego
XBox
GRANDPARENTS HOUSE
XBox
FRIENDS HOUSES
iPad
Wii
SITTING ROOM
Laptop
Mum's phone
LIBRARY
AFTER SCHOOL CLUBS

Click on a place for more detail

Click on a device for virtual places visited

DAD   MUM
TEACHER   GRANDAD
GRANDMA
FRIEND
CUUSIN
BROTHE

When i went to stay the night he played Clash of Clans with mum online - story

Grandad has a Playstation – he taught him how to use it

Face Time grandparents

Plays board games
X-Box
Wii – mum taught him how to use; he'd ask mum if he got stuck
Uses her phone – has to ask
Mum and dad have different things on phones – mum doesn't have Minecraft
Mum tells him when to stop
iPad sometimes ends up in mum and dad's room
Mum let him take Minecraft book to school
Looked up Samuel Pepys together on iPad
Play Clash of Clans with mum – I on iPad, mum on phon
Boom Beach - I'm a lot better than my mum on this got but she's only just started G. So are you teaching her again? J: Yeh
At one point refers to 'my mum's ... no my iPad'
Uses Face Time on mum's phone if dad is away
Make stuff together – like RD wall display – mum takes care and pride in it
Trying to make computer work – talks about needing to research how to make computer run more smoothly – not working since downloaded Minecraft PC
Doesn't know how to do PP – I could show her?
Mum and dad get involved – no-one is an expert
Taught mum Minecraft; so she learn to play that how you learnt Minecraft really wasn't it? Cos you've taught mummy how to play that and now mummy likes it [Mu: That's awesome [learning PP] I like learning new things [laughs]