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Apps, adults and young children: researching digital literacy practices in context

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Chapter 10

Apps, adults and young children:

Researching digital literacy practices in context

Guy Merchant

Introduction

The widespread availability of portable digital devices, such as the iPad, has led to the tablet outstripping earlier technologies in terms of its impact on early childhood. In many households, iPads have become the device of choice for family entertainment being used, amongst other things, for on-demand TV, games and interactive stories. Early literacy practices have fallen under the sway of the iPad, which appeals to young children because of its size, weight, portability and intuitive touch-screen interface (Merchant, 2014). As a result of this, and a whole host of other environmental factors, literacy development for many children born in the 21st Century has come to be infused with digital technology. This raises important issues for parents, carers and educators. For a start the commercial and economic stakes are high. But also there are some crucially important questions about learning and development that educators are only just beginning to consider. Indeed, early childhood literacy is beginning to look rather different than it did in the past, and since various forms of semiotic representation and patterns of interaction are distinctive to new media, there may well be a need to re-draw our maps of literacy development.

How we think about technologically mediated literacy practices, and how we go about investigating them are pressing questions in an era typified by the rapid diffusion of mobile

devices. Observing the ways in which the mobile is 'subtly insinuating itself into the capillaries of everyday life' (Gergen, 2003:103) draws attention to how social groups and communities take up the affordances of the technology and make them work to fulfil their diverse needs and purposes, whether this takes the form of new expressions of activism (McCaughey& Ayers, 2013), social enterprise (Donner, 2006), or financial transaction (Morawczynski, 2009). And the same is true for the everyday social interactions between partners and friends, parents and siblings, families and interest groups which are often, to a greater or lesser extent, transacted through digital media such as Facebook, Instagram, Skype and instant messaging. As a result, the ways in which literacy, technology and everyday social practice are interwoven is deserving of attention in the current climate of rapid change.

Early experiences of literacy are embedded in this wider context, and in what follows I sketch out some of the theoretical and methodological concerns that emerge from a study of the use of iPad apps conducted in two early education centres in the north of England. In doing this I work at the intersection between literacy studies and educational practice, producing an account of how we might make sense of the embodied, material, and situated experiences that are produced when hardware and software with 'global' circulation is taken up in particular local settings as part of the day-to-day lives of young children and their adult carers. This account reaches down into the detail of young children's lives and literacies, but also up into the broader context of changing literacies – changes that have involved shifts in the object of study, as these literacies themselves mutate and diversify. As we know, how we describe and define literacy, and ultimately what counts as literate behaviour is inseparable from its context - and that context, as outlined above, is rapidly changing. Furthermore, marked changes in the communicative context suggest that literacies are increasingly multiple, multimodal, mobile, and mediated by new technology.

In beginning to develop productive accounts of literacy practices in this changing situation it quickly becomes apparent that existing approaches, such as those informed by ethnography, multimodal discourse analysis and media studies provide tools, that need to be combined, recombined and creatively deployed in order to capture the richness of digital communication (Flewitt, 2011). If this endeavour is to be successful, research approaches need to be sensitive to key areas that relate to specific contexts, technologies and practices.

The approach I adopt begins with a descriptive narrative approach that accounts for some of the wider influences that frame the interactions observed. This acknowledges the complex and multiple forces associated with the distribution of the technologies themselves and the texts they mediate (touchscreen devices, popular children's stories, games and so on). Embedded within this is a finer grain analysis of how apps, adults and infants work together as the iPad enters what Schatzki (2005) refers to as the mesh of practices and material arrangements that constitute the institutional setting. To construct a microanalysis of these interactions I draw on the literature on gesture, touch and pointing (eg: Clark, 2003; Kendon, 2004; and McNeill, 2000), and recent work on haptics (Minogue & Jones, 2006) in order to underscore the ways in which the iPad is positioned within adult-child interaction as a 'thing in use', thus becoming absorbed into routines of educational practice.

Building on the ways in which early years researchers such as Flewitt et al. (2009), Wohlwend (2009) and Taylor (2010) have used multimodal discourse analysis, my approach highlights the material interactions that take place between people and things, by identifying the ways in which the smallest of actions contribute to the ways in which meaning is created through action in social settings (Scollon, 2001). In some ways this has parallels with the

work of Norris (2012) who describes how modal hierarchies fluctuate within everyday interactions. So, for example, in Norris's data, a painting is moved (object-handling mode), pointed at (deictic gestural mode), and then talked about (spoken language mode) and the hierarchical position of the modes shifts from one moment to the next as meaning is produced. This sort of analysis goes some of the way towards accounting for material interactions but, in Norris's example, the object remains silent, as a mute accompaniment to human interaction. When scripted material objects - like iPads - are so deeply woven into activity, a broader perspective is needed, one which shows how technologies can generate, initiate, and participate in action. Accordingly I use Latour's term actants to describe the agency of iPads and iPad apps, in illustrating how objects are 'participants in courses of action' (Latour, 2005: 70) and the meanings that are created and recreated.

Technology, materiality and practice

To assert that communicative contexts are changing, and that hardware and software have global circulation suggests a smooth, homogeneous kind of universalism. Recent research and writing challenge this view. For example, Auld's (2007) study of technology-mediated indigenous story-telling in Northern Australia and Lemphane & Prinsloo's (2014) work with mobile technologies in two communities in South Africa both serve to illustrate how socio-economic forces and cultural values pattern local responses to global resources.

Technologies travel as multinational corporations seek out new markets for their products, but the role that they play in everyday life is always subject to the particularities of the local (Prinsloo, 2005). In fact, to say that new technologies have global circulation is an unchallenged assumption in much of the literature on new literacies. Although major corporations, such as Apple, are built on a model of production and distribution, which reaches across national boundaries, the notion of 'the global' should be approached with

some care. When used in a contemporary context, the global is often used as shorthand for universalism, connectivity, and the 'inevitable' state of late capitalism (Law, 2004).

Instead of global we might do better to place our emphasis on an idea like 'translocal assemblages' (McFarlane, 2009), which is suggestive of the ways in which complex and multiple forces coalesce as place-based events – events that are partly constituted by the exchange of 'ideas, knowledge, practices, materials and resources across sites' (McFarlane, 2009: 561). This counters ideas of homogeneity, as it becomes clear that local interpretation always determines how ideas and things are understood, interpreted and how they interact with other forces. To put it another way, we might replace the idea of 'the global' as an undifferentiated universal space with an understanding that 'the global is situated, specific and materially constructed in the practices which make each specificity' (Law, 2004: 563). In the light of this, it may be more helpful to view technologies, such as iPads as 'placed resources' (Prinsloo, 2005), and to recognise that their use is always flavoured by the local as instantiated in routines, relationships and day-to-day operations, as well as by the beliefs, understandings and experiences of participants. Such a perspective underlines the idea that 'people and the material things they use are inextricably bound together' in everyday practices (Merchant, 2014: 28). In other words, looking at either humans or the technologies they use in isolation provides a somewhat impoverished account. This is what Ihde implies in referring to the 'active relational pair, human-technology' (1993:34). Based on this perspective it is evident that 'the things in use' - in this instance the incorporation of touchscreen devices in early years educational practice - have to be of central concern, and this in turn necessitates developing an analytical approach that includes the materiality of the iPad, its technological affordances, and how it is positioned in adult-child interaction. By extension it must also be recognised that the relationship between iPads, adults and children

does not take place in isolation – in a sort of social vacuum; it is situated in a larger context, constituted amongst other things by the discourses and practices of mobile technology use (Caron & Caronia, 2007), and of adult-child relationships in the context of school literacy practices.

Recognition of the active role that technologies play in our lives, owes a lot to the insights developed by Latour who argued that what we do is co-shaped by the things we use (cf. Latour, 2005). In this two-way relationship, technologies 'evoke certain kinds of behaviour' and through their scripted design they help to 'shape the actions of their users' (Verbeek, 2006: 362). This is not only illustrated by the multi-tasking gestures of tapping, swiping and pinching that have rapidly become normalised in the use of touchscreens, but also in the way in which hands and fingers are choreographed in the operation of specific apps, and how these apps then take their place in adult-child interactions. In these and other ways the material and the representational inter-weave as adults and children make meaning from digital texts. The material continually conjures the immaterial, which in its turn relies on material experience for its significance. This reflexive and recursive relationship between the material and immaterial has been referred to elsewhere as (im)materiality (Burnett et al, 2014).

These considerations are important to bear in mind when approaching the use of iPads in educational settings. Although they may be applicable to analogous digital practices in other contexts, my concern here is to develop some operating principles to inform how we might describe the use of touchscreens in early literacy education. To summarise:

1.   The uses of technology such as the iPad are part of complex assemblages that contribute to the construction of place-based practices that are both situated and translocal.

2.   Adults, children and the material things they use in educational settings are inextricably bound together and held within wider discourses and practices.

3.   Technologies are active in helping to shape both physical and social actions of their users - physical actions and representations are interwoven in acts of meaning making.

These perspectives suggest the need for a methodology that accounts for both the detail of the active relationships between humans and technology, the subjective experience of texts and textual practices, and the ways in which these are embedded in broader historical, economic, political, and cultural flows (Burnett et al, 2014).

iPads in the early years

The empirical work under consideration here is drawn from a larger project which sought to investigate how young children respond to iPad stories in early educational settings, the types of interactions that they have with them, and the sorts of comparisons that might then be made with what we already know about the use of print texts. The research team[1] wanted to identify the affordances of the iPad for supporting young children's early literacy development, both with and without adult support. We were therefore guided by two overarching aims:

- to examine the interactions of young children when accessing books on iPads;

- to identify the ways in which the technology might support early literacy development.

Research was conducted in two early years settings both of which cater for babies and toddlers, and are located in an urban area in the north of England. The research team observed babies and toddlers under three years of age as they used iPads to access interactive stories and related apps. Ethical practice was ensured at all times, the project adhered strictly to university ethical guidelines, and parental consent for filming was agreed beforehand. iPad encounters were video-recorded by members of the research team for subsequent analysis from two different points of view in an attempt to capture touchscreen interactions and proxemics.

In the following extract I look at a single episode from the data gathered by my colleague and co-researcher Karen Daniels, which focuses on adult-child interactions around a familiar traditional story mediated by the iPad (pseudonyms are used in identifying the individuals involved). This is chosen to highlight some key methodological and interpretative issues associated with iPad technology in the context of research into literacy education, and in so doing brings into sharp focus key questions for future work. As described above, particular emphasis is given to the materiality of the technology. Focusing on the physical interactions that are involved sheds light on how the weight, portability and touchscreen interface of the iPad take on significance with young children, sometimes scripting their interactions and at others leading to more unpredictable behaviours – or actions that are harder to account for.

Observing young children with iPads A preliminary viewing of the video data highlighted the significant work done by the body and hands when sharing and using iPads. This led to

the development of a basic taxonomy to classify the different functions they perform. Here I distinguish between 1) stabilizing movements, responses to the weight and shape of the iPad - movements that are necessary to steady the device in order that participants can focus on the screen and then work at the interface; 2) control movements which are necessary for basic operations such as accessing apps, and the more complex work of navigating texts on-screen; and 3) deictic movements that are used to draw attention to the screen or to point out specific features. More detail is given in Table 1. It should, perhaps, be noted at this point that although there are many other possible movements (common multitasking gestures such as pinching and enlarging) these are not referred to here because they were not present in the data.

1.Stablilizing movements

Holding – using one or both hands to support the tablet (as one might hold a tray).

Holding and resting – as above but using legs/ knees for additional support (often only one hand is used).

2.Control movements

General tapping – using three or four fingers in a slapping motion (commonly used by the young children).

Precision tapping – using the forefinger (like the pointing gesture) or with the hand palm downwards slightly lowering one of the first three fingers so that it activates the screen.

Swiping – hand palm downward using one or more fingers to drag across the screen whilst maintaining contact.

Thumb pressing – using the thumb to tap, swipe or operate the home button.

3.Deictic movements

Pointing, nodding and other gestures – directing attention to the iPad, the screen, or visual items framed by the screen.

Table 1: Hand movements used in the iPad study

One adult, two children and three little pigs

Setting the scene

In this episode the adult, Hannah, is sharing an iPad story app with two children: Iona and Kenny. Iona is 14 months old, and throughout the story she sits on Hannah's lap. Hannah is sitting on the floor, resting against a wall in the book area (Figure 1). Kenny, who is 18 months, sits next to them - although as time goes on, as we shall see, he appears to lose interest and moves away. Although iPads had not featured in this setting before the research began, it is easy to see how their use as a device for accessing story apps is accommodated within the mesh of practices and material arrangements that work together to constitute this setting as a space for early education. Schatzki's notion of 'site ontologies' is useful here as a way of conceptualising how a small shift in material provision, such as the introduction of a mobile device, leads to modifications in some practices and continuities in others (Schatzki , 2005:476). In some ways then, the iPad substitutes for a book and is fairly readily absorbed into the routine of story-sharing – a routine which is already deeply embedded in the history

of early years practice, valorised by professional educators, enshrined in policy and curriculum documentation, and privileged within early literacy research (e.g. Flood, 1977; Hammett et al. 2003; Levy, 2010). These broader discourses flow through the material arrangements, and are observable in Hannah's choice to use the book area, and to invite Iona (and to a lesser extent Kenny) into an intimate and relaxed bodily relationship in which a shared focus on the screen is tacitly accepted.

At the same time the iPad, the knowledge and actions required to operate it, and the particular ways in which it mediates story content produces some turbulence, as both adult and children work on what is required of them to make use of it in this particular setting (what Schatzki refers to as modification to the site ontology). Although Hannah is familiar with what touchscreens do from her own use of the mobile phone, the iPad is different and it takes on a different function in an educational setting. Similarly, even though we did not profile the children's home experiences of technology, we can safely assume that the same factors are at play for them. They draw on other experiences of technology, such as TVs, computers and mobile phones and how they are used in other settings, and these experiences form part of the assemblage that constitutes this episode.

The story app that is being shared is The Three Little Pigs, a traditional tale re-designed for the iPad by a new UK-based start-up Nosy Crow, who specialise in book and app development. The Three Little Pigs has a range of interactive features that include tapping to open the app, swiping to move characters and to turn pages, and blowing into the built-in microphone to 'help' the wolf. The story and characters of The Three Little Pigs are, of course, deeply embedded in children's culture, in that they are popular and familiar, and available in a wide range of media and hence part of a global mediascape (Appadurai, 1996).

It is likely that the narrative already has a place in the particularities of these children's lives -

lives that are singular and situated, but also highly connected through this mediascape.

< Insert Figure 1: Sharing the iPad here>

Microanalysis

At the beginning of the episode Iona is cradled in Hannah's arms, as we see in Figure 1.

Hannah, who is seated on the floor, leans forward slightly as if to adjust to the infant's gaze.

They are both attending to the screen, and Hannah holds the iPad in both hands. We can see

clear parallels here with the proxemic conventions of story-sharing in the context of early

education (Golden & Gerber, 1990). In the lead up to the transcribed extract Hannah has been

showing Iona how to turn pages on screen, using the swiping gesture, and Iona's index figure

appears to be poised in readiness. Hannah has demonstrated page turning with a combination

of deictic and control movements.

Time	Speech	Movement	Actants
00:03	Snort- snort! The Three Little Pigs	Hannah is sitting on the floor and Iona is on her knee. Hannah's arms are encircling her and holding the iPad with both hands so they can both see the screen (stablilizing movement).	H and I with iPad
00:06	H:'You can read it'	Hannah points to the 'Read it to	H and I

		me' icon, and touches Iona's hand.	with iPad
00:08	Once upon a time there were three little pigs....	Hannah taps the screen with her index finger. (deictic → control movement)	app

Table2: iPad app-sharing

The screen display, how Hannah speaks to Iona, and the movements she makes are tightly woven together in an interaction in which action, representation and meaning making coalesce. After the book title is announced by the app, a screen providing options is displayed ('Read it yourself' and 'Read it to me'). In explaining this, Hannah's deictic gesture is an integral part of the 'You can read it' utterance. Her hand in prone position with index finger extended is synchronised with the word 'read' (see Kendon, 2004). Then she draws her hand back towards her body, gently brushing Iona's hand in passing, as if transmitting a haptic learning point (Minogue & Jones, 2006). Hannah extends her hand once again, this time in a slightly exaggerated or theatrical way as if to demonstrate the gesture, then taps the screen to enable the story to play in 'Read it to me' mode. As can be seen in Table 2, this all happens in less than two seconds, but it serves to illustrate a basic pedagogical move in which gesture plays a key role.

The story begins, with the familiar opening 'Once upon a time there were three little pigs', and this attracts the attention of Kenny, who soon makes his presence known. While Iona is happy to observe, using the index finger of her left hand poised to point (Figure 2), Kenny is immediately keen to exert control. It is impossible to understand his intentions but it does

seem that he is more interested in the actions of pointing or tapping than listening to The Three Little Pigs. In the following sequence, Kenny dominates the interaction, successfully capturing Hannah's attention and her approval of his attempts to control the app (Table 3). Why he looks underneath the device is unclear. Similarly, one can only guess why Iona looks up at Hannah, although it is tempting to think that she is working to re-establish the intimacy of one-to-one story-sharing and resisting Kenny's attempts to dominate.

T- code	Speech	Movement	Actants
00:21 00:25	H:'Do you want to look at ...?' H:'The three little pigs.'	All look towards the screen.	H to K
00:30	It was time to leave their home... H:'One little pig.'	Kenny places his index finger on the screen - he could be either pointing or touching (deictic/control movement).	iPad app H, I, and K
00:34	The first little pig..... H:'Good boy!' H:'You press just there look.'	Kenny repeats the finger movement (deictic/control movement). Hannah points at the screen (deictic movement).	K and iPad app H to K iPad app

00:44	The first little pig decided to make a house.....	Kenny bends down to look underneath the iPad.	K and iPad
00:47	H:'Watch this little pig.'	Iona looks up at Hannah. Their faces are only about 6 inches apart.	I and K
00:58		Kenny grabs Hannah's hand to prevent any movement, and taps the screen with his index finger (deictic/control movement).	K, H and iPad app
		Kenny holds up his finger, with pride.	K

Table 3: Kenny and the iPad

After this, Kenny appears to lose interest, crawling behind Hannah and then kneeling at a nearby book trolley. As Iona and Hannah continue with the story, he holds up a board book, which slips from his grip and turns upside down in his hands. He then tries to open it before it slides through his clasped hands and drops to the floor. Hannah and Iona resolutely continue to look at the iPad, listening to The Three Little Pigs. With careful support from Hannah, Iona gradually builds the confidence to turn pages herself. Only some of her efforts meet with success. In Figure 2 we can see Iona practising her page-turning; Kenny clutching a rail with his left hand looks somewhat dejected. Throughout this he maintains contact with Hannah,

applying firm pressure with his right shoe, to ensure that she cannot ignore his presence (Figure 2). Perhaps as a result of this, Hannah looks across at Kenny to re-engage his attention. It seems to work and Iona shifts to the right as Kenny approaches from the left.

< Insert Figure 2: Preparing to tap>

Although Hannah tries to keep the narrative going with Iona there is now competition for her attention. As Kenny kneels down he extends his index finger to tap the screen, and Hannah angles the iPad in his direction. Kenny changes his gesture at the last minute so that when his hand makes contact with the iPad the thumb comes to rest on the home button, which he presses decisively (see Figure 3). The story comes to an abrupt end and Kenny looks up at the camera grinning mischievously. At the same time he levers himself up into a standing position with one hand pressing down on Hannah's forearm and the other on the book trolley.

<Insert Figure 3: Kenny finds the home button here>

Making sense of iPads and apps in context

In the data presented a number of themes come to the fore. To some extent these illustrate the continuities and discontinuities with the story-sharing routines that are part the mesh of practices and material arrangements that constitute literacy work in the early years. For instance, the proxemic arrangement of adult and children and text hold a lot in common with the story-sharing behaviour associated with print media. The physical proximity of Hannah and Iona and the way the device is held in both hands at a comfortable viewing distance by the adult is almost identical to book-sharing. Even Kenny's attempts to join in, take over or disrupt (depending, of course, on one's interpretation) are also to be found in informal story

work in early years settings, and although it is tempting to read this as gendered behaviour, judgement should, perhaps be reserved.

 As we saw above, Hannah also makes some simple pedagogical moves - moves that are analogous to those found in print book practices. For instance, she directs attention to the text, she encourages page-turning, albeit on-screen, and she gives feedback. But these moves are also subtley different to those involved in book-sharing, and they would appear to be new to both Iona and Kenny. These functions depend on quite specific control movements on the flat touchscreen surface of the iPad - there is a narrow margin of error. A particular kind of kinaesthetic control is needed, and it is different to that required when turning the pages of a print book. Kenny's behaviour deserves further comment, too. His engagement with the iPad seems to be more anchored to its materiality, the actions he can make and the control that he can exert, than to the story that the device mediates. Is it a mere accident that his first response is to make control movements, that he moves away when successful, and returns only to end the story before it is complete?

This isolated example of app interaction in an early years setting has focused on the analytical tools that are necessary for building an understanding of digital literacies in context. This has been based upon three orientations. Firstly, I have argued that we need to develop detailed descriptions of how working with mobile technology is part of a translocal assemblage in which ideas, practices and material resources from diverse sources coalesce as a space for meaning making. In doing this they jostle for space within the institutional site ontology of the educational setting, creating continuities and discontinuities with existing practices. Secondly, I have illustrated the need for an approach, which takes into account the materiality of the technology – not only in terms of the size, weight and rigidity of the tablet

device, but also its specific operative functions. These characteristics establish distinctive ways in which meanings are made, how the stories themselves are experienced, how readers navigate a route through the text –and, of course, by implication and extension, how texts are then shared. Thirdly, I have suggested that technologies are active in helping to shape both physical and social actions of their users. The iPad is no exception as it requires specific gestures, control movements and physical adjustments to its material and technological affordances.

Both iPads and apps are located in the global mediascape of contemporary childhood and in this sense they contribute to the everyday experience and popular culture of toddlers and young children just as much as book-sharing, TV and related media play. So although print literacies still have an important role to play, the new literacies of digital technology are now making significant in-roads into early childhood, and it seems that portable touchscreens, such as the iPad, have a key role to play in educational provision at home and in early years settings. Literacy education now needs to draw upon, and develop methodologies that provide us with insights into how culture, technology and meaning-making practices are intertwined if we are to capitalise on their learning potential.

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