

Chapter 2

The Fluid Materiality of Tablets: Examining ‘the iPad Multiple’ in a Primary Classroom

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Introduction

In an article exploring the multiple practices circulating around the 2001 Foot and Mouth epizootic in the UK in 2001, Law and Mol (2008) present a photo of a sheep and argue that it becomes something different, or is ‘enacted’ differently in relation to different practices: they describe for example the veterinary sheep, the epidemiological sheep, the economic sheep, and the farming sheep. Rather than representing a single sheep, the photo represents a ‘sheep multiple’, and different versions of sheep interface with each other in complex ways. At the same time, the sheep is not just enacted but also acts (as it grazes and shapes the landscape for example). As Law and Mol explore, sheep are therefore ‘actors-enacted [...] entities give each other being: they enact each other’ (Law and Mol 2008: 58). Law and Mol’s article builds on their previous theoretical work—separately, together and with colleagues—highlighting how things (such as fish farms, diseases, aircraft design) come into being in multiple ways through different sets of relations (Law 2002; Law and Lien 2010; Mol 2002; Law and Mol 2002). Their work highlights particularly how things are *known* multiply and that different *ways of knowing* come into play through the *process of knowing*. The implications here are twofold: first there are multiple ways of knowing; and second these ways of knowing themselves come into being as they come into relation with things. In this chapter I draw on Law and Mol’s work to explore multiple actor-enactments of tablets in classrooms.

This reflexive take on agency and enactment provides useful critical purchase when investigating tablet use in classrooms. While limited funding often means that tablets are by no means ubiquitous, their entry into classrooms has been somewhat less problematic than that of other high-cost digital devices. Guidelines for teachers have often described them as easily assimilated into existing practices, not requiring

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the high levels of organisational labour associated with managing access to scarce PCs or computer suites (e.g. BBC n.d.). And yet, this apparent ease can distract from the multiple ways in which iPads get taken up in classrooms in practice and the implications of this multiplicity for teaching and learning. As a literacies researcher I am interested in the ‘classroom-ness’ of technology use, a term I have used to capture the reflexive relationships between: what digital technologies become as ‘placed resources’ (Prinsloo 2005) in classrooms; what other things—including classrooms—become when digital technologies are present; and the kinds of meaning-making that happens through and around them (Burnett 2014). To phrase this in Law and Mol’s terms, I am interested in the multiple ways that digital technologies are enacted by *and* how they act on their surroundings, and in the inseparability of these actor/enactments.

Moving from sheep to tablets is perhaps a little unorthodox, not least because evoking comparisons between sensory beings and inanimate devices is morally and ethically problematic (Crary 2016). However, the idea of the multiple is useful in drawing our attention to how tablets can, like sheep, be ‘actor-enacted’ in various ways. Of course tablets are complex devices. Their ‘layered architecture’ (Yoo 2010) includes: their physical presence as objects of certain size, shape, weight and texture; their interactive features; the apps they mediate; and the digital artefacts they archive. In educational discourse, much is made of their ‘intuitive’ interface and the possibilities offered by their portability (e.g. Siegle 2013). However, as explored in Chap. 1, tablets could also be seen as actor-enacted in other ways, in relation for example to their production: the working conditions of those involved in manufacture; the extraction of constituent minerals and associated environmental costs; and the machinations of the multinational companies that produce them. And different brands may be enacted differently by marketing campaigns that align them with certain lifestyles, values, or price points. Tablets, then, are actor-enacted in multiple ways as they combine with other things, people, ideas, priorities, practices and so on. They become different things ‘in relation’ or, to put it another way, they become different things through different ‘assemblages’ (Deleuze and Guattari 1988). As Law explains, an assemblage is not a permanent set of relations but can more usefully be seen as a *process* of entanglement—as a verb, in effect, not a noun:

...assemblage is a process of bundling, or assembling, or better of recursive self-assembling in which the elements put together are not fixed in shape, do not belong to a larger pre-given list but are constructed at least in part as they are entangled together. (Law 2004: 42)

In adding to the growing body of work that is exploring tablet use in practice (for example see Kucirkova and Sakr, Chap. 11; Daniels, Chap. 12), in this chapter I therefore consider how tablets become different things, or are actor-enacted differently, through different assemblages (or assemblings). Rather than seeing tablets as static, fixed items, I draw on a study of classroom technology use to exemplify how tablets, like sheep, can be seen in terms of multiplicities. There are two inter-weaving strands to my argument. First, I explore how tablets can come to

mean different things when taken up in practice as they come into relation with different things, people, purposes and so on. Second, recognising that other ways of knowing come into play through the process of knowing, I explore how I, as researcher, *assemble with* the classroom episodes I encounter and describe, and foreground how different assemblages are invoked as I bring different theories into play. It is the reflexive relationship between these two strands that I go on to define as the ‘fluid materiality’ of tablets. In summary, this chapter asks the following:

- In which different ways are tablets actor-enacted in classrooms as they assemble with other things, people and practices (as opposed to how they might be actor-enacted elsewhere, e.g. when reading an e-book on a train for example or in a street playing Pokemon Go)?
- What kinds of relationships are associated with use of tablets in classrooms, and what kind of meaning making opportunities do such relationships generate?
- How do different theoretical positions help produce different assemblages?

Researching Tablets

While this chapter is primarily conceptual in nature, it draws extensively on illustrative data from an 8-month study of technology use in one classroom in a small village school in northern England, during which I observed how a class of 10–11 year olds created and interacted with one another on- and off-screen during their final year of primary schooling (Year 6). Before proceeding, and in order to contextualise what follows, this section provides further detail on the context and methodology for this project.

It is worth noting from the outset that the teacher in the classroom where this study took place was committed to planning motivating activities and enabling children to draw on a variety of media. He was also cognisant of national requirements associated with the rather reductive English curriculum in England (DFE 2013) and its expectation that children should be competent in certain ‘schooled’ ways of ‘doing literacy’ prior to taking national standardised tests and their imminent transition to secondary school. These dual priorities intersected in various ways in the activities he planned for the children. I visited the school for half a day on average once a fortnight between November 2012 and July 2013. Scheduling around my other commitments and avoiding school trips and other special circumstances meant that visits were unevenly timed. They lasted an average of 2.5 h on sixteen occasions.

Adopting an ethnographic approach, the study drew on a variety of tools to capture the entwined nature of children’s on-/off-screen activity (Hine 2000): field-notes, group interviews, analysis of digital artefacts and talking to children as they played and worked. Video was used to record the fine-grained detail of children’s interactions, and field-notes to record my impressions, feelings and responses, as well as to try and capture the complex patterns of interaction that cut

across the classroom and beyond. Field-notes began as brief scratch notes (Sanjek 1990) written during lessons which attempted to capture how children interacted with one another and with the things around them, both things that were present physically and things on-screen. I was interested in the incidental as well as the planned, and so noted not just how children approached the tasks set by the teacher, but other activities and interactions that interwove or overlaid those tasks. I approached these notes as positioned and partial perspectives rather than as records of objective truths. I recorded my own thoughts, feelings and reactions alongside what, from my perspective, children did. My notes were expanded into more detailed narratives soon after each visit. I also engaged in post-lesson discussions and email exchanges with the teacher to gain his perspectives on how children interpreted the activities he planned for them, and also on how their responses related to what happened at times when I was not present.

While I was interested in how children drew on a range of devices (including PCs and laptops), tablets featured extensively in the life of this class. The school had a class set of 15 tablets (iPads¹) and these were stored in the Year 5/6 classroom. Consequently, the children had access to the tablets whenever other classes were not using them, which was often, and could frequently choose to use them if they wished for ongoing classroom activities. In every lesson at least some children made use of iPads, usually to access the internet or to use 'open content' apps (Flewitt et al. 2014) such as Pages, iMovie and Keynote.

I conducted an initial analysis of what children did with iPads and how this related to the tasks the teacher set. Following repeated readings of the data I identified three categories of purposes implicit within the teacher's designed activities and/or within what children did: mediating information; information-seeking; and creating digital artefacts (for summary and examples, see Table 2.1). However in considering the data, I also attempted to think expansively about the multiple ways in which people and things interacted. In trying to 'think' or 'read' *with* the data (Ingold 2013), I was interested in how different theories associated with materiality could support thinking about meaning-making using tablets, so drew on different theoretical perspectives to interrogate how I was making sense of what I observed, and used data to re-visit those perspectives. Elsewhere Guy Merchant and I have written about the methodological traps generated as we research and write about practice and inevitably bound what we do (Burnett and Merchant 2014). Thinking with the 'iPad data' from this project re-animated these debates for me. Not only was my physical presence as researcher in this class significant to what happened and to the kind of data I generated, but as I worked with my data I focused on some things and not others, and framed what I did see in certain ways. I was *part* of the assemblages I attempted to describe, as were the theoretical tools I used to make sense of them. Through collecting stories from the

¹I refer specifically to 'iPads' for reasons of clarity as these were the tablets used in this classroom. Chapter 1 problematises the dominance of iPad both in the market and in the educational discourse on tablets.

Table 2.1 iPad uses in teacher planned tasks

	Teacher-initiated	Child-initiated
Mediating	Using QR codes to access clues to a mystery in local park	– Holding up iPads to each other to show what they found out
Information-seeking	Researching tornados	– Searching through images and checking interpretations with friends —‘is that a tsunami?’
	Using e-dictionaries to find meaning of topic words	– Googling a word for a definition before using it – Using an e-dictionary to locate a word they have already used, in order to help define it for a friend
Creating	Creating e-books based on the theme of tornados	– Adding, cropping, moving, re-sizing images – Looking across at how others were creating – Reaching across to fix/change others’ creations
	Writing poetry	– Playing with colour, font, layout in e-books

classroom that shared a focus on iPads, I was engaged in a process of sorting and classifying. This process itself enacted tablets as significant participants in classroom life when other things may have been more—or just as—salient to the different things that occurred.

Recognising the impossibility of accounting for all ways of knowing, Mol and Law (2002) suggest that in thinking about the multiplicity of experience we should resist the temptation to work towards coherence and instead acknowledge that we can only ever gain partial perspectives. One of their suggestions for doing this is to think in terms of ‘lists’ which do not necessarily classify or suggest completeness. As Mol and Law write, ‘the list abstains from taming. It groups together but it doesn’t tame’ (Mol and Law 2002: 14). Following their lead, in the next section I *list* four actor-enactments of tablets as I perceived them within different assemblages.

My descriptions of these four actor-enactments are all based on classroom observations. They do not range widely across domains as Law and Mol do in considering the sheep multiple. Nor does my analysis give full attention to the broader social, economic, and political activity that holds these actor-enactments in place (as discussed in Chap. 1). As stated earlier, the tendency to exclude such considerations from classroom studies is problematic and can reinforce bounded analyses of classroom life. Importantly then my list of actor-enactments is not presented as definitive. It does not preclude other actor-enactments that might be evoked through using other methods, or by thinking differently with data. Notwithstanding these limitations, the four actor-enactments do, I suggest, relate to a diversity of relationships between people and things reflecting some of the

complexity of school life (Nespor 1997), and in doing so illustrate some of the ways in which a tablet might be seen as a tablet multiple. The four actor-enactments listed concern tablets as follows:

- Schooled *devices*
- *Playthings*
- Community *artefacts*
- *Objects* among many objects.

In referring to the four actor-enactments, I use different terms—device, thing, artifact, object—to suggest diverse ways in which their materiality seemed salient. The different terms are intended to reflect the different *kinds* of relations between people and iPads generated through different assemblages and, as I shall explore later, also index different theoretical perspectives. In each case, there is a reflexive relationship between iPad as actor and as enacted. I use a series of brief examples to illustrate each actor-enactment.

iPad as Schooled Device

In this classroom, iPads and the apps that they mediated became schooled devices as they assembled with other official school ‘stuff’: targets, children as ‘pupils’, adults as ‘teachers’, lessons, timetabling conventions, interactive whiteboards, workbooks and so on. They were conceived in terms of their functionality: their small size enabling the portability needed for flexible use across a range of teaching and learning activities; the ‘intuitiveness’ of their interface facilitating easy access; and the range of available apps allowing them to be re-purposed for curriculum use. My analysis of the teachers’ planned uses of iPads identified three categories of activities that built on the iPads’ functionality: creating texts, searching for information, or accessing texts or environments (see Table 2.1, column 2 for examples). In line with expectations in English primary schools, these activities were designed to generate ‘outcomes’ to evidence children’s learning: animations, e-books, poems and so on.

In these examples, iPad uses partly reflected and helped constitute ‘school work’ as something that was materially evidenced and physically embodied as individual and sedentary (Dixon 2011). However, the iPads offered possibilities that, when taken up, shaped how school work played out in practice. In addition to using apps planned by their teacher, children used other apps—readily available on the iPads—to help them with set tasks (See Table 2.1, column 3). While still working towards the teacher’s designated purpose and outcome, often this involved supplementing required tasks with others and engaging in activities unprompted by their teacher. Like children documented in previous studies of children’s digital composition in class (e.g. Burnett et al. 2005; Matthewmann and Triggs 2004), they experimented with colour, font and layout in the texts they created. They also drew on different apps as they searched for images or information to use in their creations. They

operated across modes, media and resources, making choices about design or strategy and readily moving between apps, doing schooled literacy in ways analogous to the rhizomatic web-based explorations so common in everyday life (Long 2014). In video footage they appeared as multi-skilled absorbed workers, gradually constructing and refining texts of various kinds. For example,

Joe rested the iPad on the table in front of him, the heels of his hands on either side, using his thumbs rapidly and flexibly (game-like) to access the virtual keyboard, to select and drag, choosing fonts, changing colours, moving text around the page, and typing. His gaze was fixed on the screen, the iPad forming a fourth wall to his individualised space. Gradually, as he tapped and swiped, the e-book cover he was designing took shape on the screen in front of him.

The physical size and shape of iPads not only enhanced their functionality as devices but offered other possibilities which children took up. In this class, the iPads had articulated cases so they could be stood up at an angle for easy typing. As such they were sometimes recruited as barriers, carving out spaces for children to work alone or with friends, just as often happens with laptops (e.g. Burnett 2014). While concealing their ‘work’ from those across the room or table, the upright screens made it more visible to those sitting next to them, and children’s on-screen actions and creations frequently stimulated discussion and other activity. Like Simpson et al. (2013), I noticed how children looked across at each other’s screens and emulated what others did, or ‘invaded’ screens by reaching across to help or prompt someone to do something. While children were variously skilled, this visibility allowed them to learn from each other about what was possible in terms of design or functionality. They were also each other’s instant audiences. They often held up iPads to show their creations to friends, or glanced across at others’ screens and made evaluative or appreciative comments. If recording sound, for example a commentary for a stop-frame animation, they played it back to their friends, checking out what it sounded like (‘Do I sound weird?’). The iPad’s thingness invited easy switching between individual composition and communal activity—the children passed iPads round, reached across to tap on each other’s screens, or held screens high so those far across the classroom could see.

When considered within an assemblage of schooled stuff, iPads were enacted as schooled devices, but also acted in ways that shaped schooled practices, making them sometimes more private, sometimes more public, and that facilitated meaning-making across modes and media. In these ways, iPads mediated interactions that both reinforced and disrupted the individualised and ordered physicality more typically associated with meaning-making around printed texts in Year 6 classrooms in England. Children, iPads, apps and teachers seemed to assemble to enact iPads as schooled devices, but in doing so, the kinds of things that could be construed as ‘school’ or ‘school literacy’ perhaps shifted a little.

iPad as Plaything

Many of the things children encounter in school have an institutional quality. Formica topped tables, moulded plastic chairs—even pencils—are modified, standardised versions of the furniture and writing implements they may use elsewhere (Lawn and Grosvenor 2005). While tablets designed for children are available and used increasingly in early years settings, primary schools in England tend to use tablets produced for the general market (most commonly, at the time of writing, iPads). As such, a tablet is one of the few items that, in design and functionality at least, is not tamed for school use. In this class, meanings switched between the officially sanctioned and the playful as children easily navigated the devices, often drawing on expertise developed at home. Sometimes, as explored in the previous section, this expertise was put to work for schooled ends. At others, it assumed a more ludic dimension as children assembled with familiar apps and specifications, and as they did so became ‘friends’ not ‘pupils’.

When gaps or spaces opened up in lessons—for example as children waited for the teacher’s assistance, during changeover periods between activities, or as they shared what they did with those around them—children often drew on iPads in playful ways. For example,

During a hiatus in the lesson, Ben scrolled through and found some photos he had taken of his friend, Stevie, on another day. He held up the iPad displaying one of these to Stevie who was sitting at a nearby table. Stevie responded by using the camera on his iPad to take a photo of Ben. When he held this up too, others caught on and the photo-taking/displaying spread.

As Dyson (1993) explores, school literacy tasks are often experienced and enacted in multiple ways as children over-layer them with different purposes and relationships. In the following example, the iPad is briefly actor-enacted within what she calls a ‘peer world’ that assembles with the schooled literacy described in the previous section:

Luke and Joe were composing promotional materials for a town in India they had been researching. Each was writing ‘copy’ for a leaflet to be used to publicise a local tourist spot. While both slowly completing the task, neither seemed particularly interested in the Milk Factory they were writing about. Luke began writing a sentence as part of his blurb: ‘The Milk Factory is a great place to visit. It may sound a bit old and boring but really it’. At this point he tapped Joe’s arm and pointed at his iPad and the unfinished sentence. The two boys exchanged a smile, and then Joe took the iPad and finished the sentence off: ‘The Milk Factory is a great place to visit. It may sound a bit old and boring but really it...is old and boring’. Having read Joe’s words and exchanged another smile, Luke took back the iPad and took a screenshot of Joe’s joke. Then he deleted Joe’s words and finished the sentence, ‘The Milk Factory is a great place to visit. It may sound a bit old and boring but really it isn’t. Here is why. It has a nursery, lake, platform and panic facilities.’ Re-reading what he had just written, he noticed the ‘panic/picnic’ spelling error (an autocorrect) which he showed to Joe causing more laughter before deleting, correcting and continuing.

Joe’s joke was erased from the official version of the text but, archived by the screenshot, it remained on the iPad. Later, Luke told me he often took screenshots

of jokes like this one to show his friends later, capturing playful interactions that would otherwise be forgotten. As well as enacting the iPad as schooled device, children—not just working but playing alongside their friends—also enacted iPads as ‘playthings’, drawing on affordances they had picked up elsewhere to joke around. The iPad through its autocorrect (with its picnic/panic substitution) generated further potential for humour. Luke and Joe’s playful interactions in some ways ran parallel to schooled ‘work’ in a ‘concealment track’ (Goffman 1974: 218). However, they also wove through and helped to re-work the official task. The iPad was actor-enabled as plaything as its small size, features and apps assembled with the boys’ friendship, physical proximity and history of working and playing together. Humour, written *out* of the schooled task, was written *into* their interactions around it.

iPad as Community Artefact

The class teacher reminded and expected children to upload their ‘outcomes’ (e-books, animations and so on) to personal files held in the cloud. However, children’s unofficial, incidental and ludic creations (such as the screenshot and photos described above) stayed archived on individual iPads. Each iPad generated a specific collection of physical/virtual possibilities and affordances that morphed over time and consequently certain iPads gained particular currency in the class. Whereas iPads were for communal use by the whole school and supposedly identical, individual iPads were differentiated by numbers or labels for auditing purposes. Children could therefore distinguish between them and locate ‘their’ iPad or the one that housed images they had archived during previous lessons. For example, one child, Fran, scrolled through images she had previously captured on an iPad before taking her friend Sophie through them like an envelope of photos. She hinted at the shared experiences they captured, occasionally inviting Fran to ‘*remember that*’. The iPads archived the children’s shared histories together in this class.

These examples illustrate how children’s actions changed what the iPad became just as the affordances of the iPad changed what the children could do: the iPad saved the photos taken by the children, and then, when used again later, offered these up again; it became a depository of things they had produced, an archive of past jokes and experiences to call up at a later time. These unofficial digital texts were in many ways analogous to the notes passed under the desk, graffiti on workbooks and scrumpled drawings that are commonplace in many classrooms; they seemed to carve out spaces for maintaining and generating peer relationships (Maybin 2006). Individual iPads then were actor-enacted as community artefacts, holding unofficial traces of the children’s time together, generated through assemblages of iPad, archive function, friendship and shared histories.

iPad as One Among Many Objects

The three actor-enactments explored above are in some ways easy to describe, as they align with other accounts of literacy practices in schools that see school literacies as multiple, social, cultural or ecological (e.g. Dyson 1993; Maybin 2006; Nespor 1997). The fourth (which might better be seen as a *set* of actor-enactments) is harder to categorise but is included here to hint at how other assemblages might conjure not just other actor-enactments but other ways of theorising interactions between humans and non-humans.

In this classroom, iPads were often found mingled with other stuff: pencils, paper, coloured card, scissors, foil and so on. As such, they became just some among many other objects, their physical affordances taken up in various ways. They were most readily re-purposed as surfaces. On a picnic as part of an adventure in a nearby park, for example, some children used their iPads as tables, eating baked bananas and chocolate off their flat surface. At other times iPads were piled amid other flat rectangular objects, papers, books, workbooks or used as trays to carry task-related items such as pencils or pens across the classroom. They assembled in multiple ways with other things, enabling and being shaped by embodied interactions.

Observing a whole class discussion as a prelude to a literacy lesson, for example, I noticed how children fiddled with iPads; just as they rocked on chairs, tapped on tables, put fingers in mouths and waggled spectacles, so they touched and stroked iPads, twiddled wires, and flapped case-lids up and down. So how to make sense of such ephemeral and perhaps rather insubstantial interactions? We might for example see the suppressed movement channelled through these haptic interactions between bodies and things (including iPads) as enabling the stillness expected of disciplined classroom bodies (e.g. see Dixon 2011). iPads became what are sometimes call ‘fiddle toys’ or ‘fidgets’, outlets for the restlessness that can be seen as inappropriate or even transgressive in a classroom. Or perhaps this stroking, squeezing and touching might be understood differently, as a sensory engagement rarely documented in accounts of literacy practices, and which perhaps complements recent studies exploring aspects of haptics and mobility in iPad use (see Simpson et al. 2013; Merchant 2014; Ehret and Hollett 2014). In any case, these kinds of actor-enactments foreground the physicality of iPads and the significance of size, heft and texture to how they are actor-enacted in classrooms.

The Fluid Materiality of the ‘Tablet Multiple’

There have been many critiques of the technological determinism that sees digital technologies as driving change or operating as ‘deliverers of literacy’ (Burnett 2010). However, there is still a tendency to explore what tablets ‘do’ in classrooms in ways that suggest agency resides with the technology (see Hutchinson et al.

2012). The 'list' of actor-enactments provided above illustrates a more distributed take on agency. Uses switched between the officially sanctioned and the playful and incidental; tablets came to be in the moment, and in relation to multiple histories and spaces. The iPad was variously actor-enacted as device, plaything, artefact and object. Echoing Law and Mol's notion of the sheep multiple, it was a *tablet multiple*. It is worth reiterating here that my 'list' of actor-enactments is not presented as definitive. It simply provides examples of what iPads seemed to become, or how they came to be known, in this classroom. A tablet is all the actor-enactments listed here and more. Multiple other assemblages would be conjured as the iPad assembled alongside people and things in other times and places, with different apps for example or in relation to specific commercial, economic or political developments.

Importantly, these multiple 'actor-enactments' were not separate but interlaced with each other. Like the actor-enactments of Law and Mol's Cumbrian sheep, they merged in different ways. Indeed, it is this very contemporaneity and fractionality (Law 2004) that may itself be generative for classroom research and practice. For example, the iPads' multiple actor-enactments could all be seen as having implications for how the children and their teacher managed the process of being together in class. iPads as artefacts, objects, things and devices were all significant to the class community; the social life of the classroom 'became' differently due to these different actor-enactments of iPads.

Recognising these shifts, however, highlights what might be called the 'fluid materiality' of iPads, a term I use in two inter-connected ways. First, I use it to capture how iPads were actor-enacted differently through different assemblages and in doing so were shaped by, and helped construct, multiple and diverse relationships, activities and endeavours, operating within a mess of bodies, texts and other objects. This acknowledges what Ihde (1993) calls their 'multistability', the way they 'become' differently as they are constituted differently through different relations.

Second, 'fluid materiality' is intended to evoke how materiality itself is conceived differently through different assemblages. The terms I have used to distinguish the four actor-enactments of iPads presented here—schooled *device*; familiar *plaything*; community *artefact*; material *object*—not only position the tablet differently but assume different kinds of relations between humans and non-humans. While 'device' may assume a utilitarian relationship, for example, 'artefact' may suggest one that is invested with personal, social and cultural meanings. This in turn encourages us to go beyond thinking in terms of different dimensions of the iPad to thinking about materiality in multiple ways.

Recent debates about materiality in literacy studies have been characterised by a series of theoretical, methodological and analytical moves, which present—and indeed enact—relationships between human and non-human participants differently. Pahl and Rowsell's work on artifactual literacies, for example, draws on theories of material culture and multimodality (Pahl and Rowsell 2010) to see artefacts as infused by spatially and historically situated practices. This perspective helps us conceptualise how iPads are inflected through use over time, and provides ways into considering what children's interactions around iPads mean for them, as

for example, the archiving of photos changes what an iPad can do or be. From another perspective, an iPad is also a thing of certain size and shape that becomes something different as it is held, stroked or touched differently by different hands at different times. Like Ingold, for example, we can see *things* too as participants:

Though we may *occupy* a world of objects, to the occupant the contents of the world appear already locked into their final forms, as though they had turned their backs on us. To *inhabit* the world, by contrast, is to join in the processes of formation. It is to participate in a dynamic world of energies, forces and flows. (Ingold 2013: 89)

For Ingold, everything is always involved in its own ‘thinging’; things are always emergent and evolving and therefore we are always in ‘correspondence’ with things. New materialist scholars have developed similar ideas by exploring complex relations between the human and non-human that go beyond the socio-cultural in examining relationships between the material and the discursive (Coole and Frost 2010). The tablet multiple therefore is all those things/devices/objects/artefacts described in this chapter but is also many other things, which might be evoked by bringing different conceptualisations of materiality into the mix. To emulate the Deleuzian evocation of the stammer that continually evades certain knowledge, an iPad is a thing *and* a device *and* an object *and* an artefact ‘AND...AND...AND...’ (Deleuze and Parnet 2002: 8).

Implications of the iPad Multiple

Thinking with this data and thinking with different conceptualisations of materiality, I therefore want to argue that—in engaging with the complexity of meaning-making around iPads in classrooms—we need to hold together *multiple* perspectives. By looking at different actor-enactments and examining how they interlace, interface and interfere with one another, we might better understand notions of ‘agency’ in relation to technology. New technologies do not ‘impact’ on classrooms. Nor do teachers or children simply put new technologies to work. If we see the world as a set of stable realities there to be uncovered, we may miss alternate possibilities or ways of being that may be more resonant and potentially more beneficial to learners. By seeing children and many other things as ‘relationally linked with one another in webs’, we can see how ‘They make a difference to each other: they make each other be’ (Law and Mol 2008: 58).

Educators and researchers exploring how they might work with tablets then need to consider, observe and respond to their use in relation to a whole range of ‘stuff’, where stuff is meant expansively to include bodies, things, rules, frameworks, conventions, practices, memories, purposes, desires, feelings and so on. They also need to consider how different theoretical perspectives help enact what iPads become in research and therefore, I argue, hold together different theoretical perspectives in order to evoke multiplicities. A stance which embraces multiplicities in this way helps us engage with the multiple relationships generated as different kinds

of stuff entangle with one another. It draws our attention to the diverse ways that children use tablets to engage with and re-work schooled practices, but also how tablets as objects, devices, things and artefacts work to offer up new possibilities, and to how these enactments and actions construct one another. Elsewhere I have argued with Guy Merchant (Burnett and Merchant 2017), that this focus on assemblage—or as we term it, ‘assembling’(to emphasise the inevitable process of ongoing reassembling implicit in the notion of assemblage)—can prove generative in thinking about research and practice. It can throw into relief other ways of knowing what children do and what technology might offer.

Returning to Law and Mol, then, tablets are actor-enacted through their relations with other things, as constituted through different assemblages:

What each actor does also depends on its co-actors, on whether they allow it to act and on what they allow it do, on rules and regulations. But this is not to say that an actor-enabled is determined by its surroundings. It has its own stubbornness and specificities, it is full of surprises. (Law and Mol 2008: 72-3)

A focus on fluid materiality highlights how iPads become different things/objects/devices/artefacts through different assemblages, and at the same time, how tablets help construct what else is there. This is important as it emphasises that new possibilities can emerge: ‘assemblages, like actors, are *creative*. They have novel effects and they make new things’ (Law and Mol 2008: 74). While recognising that ‘fluidity’ perhaps implies too easy a movement between actor-enactments (Law and Singleton 2005), I use it here to highlight the emergent possibilities and improvisations that arise as technologies are used by people and knock up against other resources, events, interests and experiences. Existing relations are therefore always imbricated with other possibilities immanent within them. A focus on fluid materiality also highlights how our own positionality and our associated theoretical perspectives, whether implicit or explicit, shape our perceptions of these possibilities. It prompts us to consider how—as we observe, measure, analyse and conclude—we tangle together certain things and not others, and to consider the insights we might gain, or the educational possibilities we might generate, were we to tangle things up differently.

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