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‘Being together’ in classrooms at the interface of the physical and virtual: implications for collaboration in on/off screen sites

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Abstract

This article contributes to thinking about collaboration in classroom/virtual environments by considering how children (aged 10-11) engage in the process of ‘being together’ at the interface of the physical and virtual. It argues that, if educators are to develop effective pedagogies that capitalise on opportunities for collaborative and participatory learning, there is a need for nuanced accounts of the ways that children and young people relate to one another across on/off-screen sites and for new ways of conceptualising their interactions. Using a four-part story based on an illustrative episode from a longitudinal classroom-based study, the article explores how a focus on what Schatzki terms a ‘practice meshwork’ can highlight how relationships are shaped by and shape diverse practices. In particular it explores how embodied relations with things in classrooms mediate ways of ‘being together’ around classroom/virtual environments. It suggests that different timespaces are consequently evoked as children play together on and around screens in class. Drawing on these ideas, the article advances five propositions about ‘being that arise from seeing relationships as entangled with multiple practices. It ends by arguing that, in planning for and researching collaboration, it is important to acknowledge how these five dimensions interface.

Key Words: digital technologies, Schatzki, classroom, virtual environment, collaboration

Introduction

Many innovative educational projects have drawn on the affordances of digital technologies to promote collaboration amongst children and young people (e.g. Charmaraman 2013; Ito et al 2013; Hull and Stornaiuolo 2014). Specifically virtual environments, such as computer games and virtual worlds, have provided opportunities for participation in new and varied practices and for joining with others to create, problem-solve and play (Gee, 2007; Merchant, 2009; Merchant et al 2013). Taking up such opportunities in educational institutions brings particular challenges. In addition to logistical difficulties linked to the availability and quality of equipment and competing pressures on the timetable and curriculum, digital technology use in classrooms is inflected by discourses associated with accountability, delivery models of learning and online safety that can militate against more playful and open-ended opportunities (Honan 2008; Wolfe and Flewitt 2010). Perhaps partly because of the frustrations and paradoxes associated with integrating digital technologies in educational institutions, projects trialling transformative approaches to learning in

virtual environments have tended to be located in 'not-school' sites such as after-school clubs, hospitals and community groups (e.g. Schwartz et al 2013; Hollet and Ehret 2014). Such projects continue to generate cutting-edge insights into meaning-making in and around virtual environments with much to offer educational practitioners and researchers.

Classrooms however still play an important part in the lives of children and young people. Despite calls to re-configure education by capitalising on new technologies to generate more flexible learning environments (see Facer 2011), an enduring feature of schools is the bringing together of diverse groups of individuals who spend time together face-to-face over sustained periods of time. 'Being together', whether positively or negatively construed, is a basic premise of contemporary schooling, and many educators work hard to establish supportive communities. Given this, classrooms have the potential to provide rich opportunities for learners to experiment, share and learn from one another as they make meanings in, through and around virtual environments. Moreover official discourses mingle with other discourses associated with alternative approaches to teaching and learning (Lynch and Redpath 2014) and with children's cultural and social worlds (Dyson 2003). Consequently, while technologies may be taken up in distinctive ways in classrooms, new spaces for learning can open up.

This article starts from the premise that, if educationalists are to capitalise on opportunities to use digital technologies to support collaboration in schools, there is a need for a nuanced understanding of how children and young people relate to one another in and around virtual environments in classrooms. It makes a theoretical contribution to such understanding by conceptualising children's 'being together' on and off screen in classrooms as 'entangled' with what Schatzki terms a 'practice meshwork' (Schatzki 2002, 97). The article begins by reviewing what has been learned from previous studies of children's interactions in and around virtual environments. Next, building on such research, a set of theoretical tools from Schatzki's work on the 'site of the social' (Schatzki 2002) are outlined. These are used to interrogate an episode from a longitudinal classroom-based study with children aged 10-11, told in a series of four parts that together illustrate how practice meshworks may be significant to 'being together.' Using this illustrative example, the article argues that children experience multiple ways of 'being together' at any one time, and that relationships between bodies and things are significant for how these are realised for individuals. It proposes five dimensions of 'being together' that could usefully be taken into account when planning for and researching collaboration in on/off screen sites.

1. 'Being together' in/around digital environments

Prior research has suggested that 'being together' around virtual environments in classrooms is shaped by the affordances of on and off-screen environments, by children's prior experience of interactions, and the possibilities generated as on- and off-screen activities merge. Merchant's study of virtual world play in classrooms showed how schooled discourses can re-frame the open-ended play associated with virtual worlds (Merchant 2010): teachers, for example, introduced rules so children played in ways more aligned with school expectations.

Similarly, Wohlwend et al (2011) document how group leaders muted the sound when children were playing Webkinz during a school-based after-school club. This had implications for what children were able to do: while the quiet room was perhaps more 'school-like', children were unable to access the spoken instructions they needed to navigate the site. These studies highlight how the 'nexus of discourses' (Scollon 2001; Wohlwend et al 2011) that inflect school-based experimentation with virtual worlds plays out in embodied relationships to physical surroundings, and through deferred embodiment (Marsh 2005) as avatars interact with each other and their on-screen environment.

In some respects these ways of 'being together' around virtual environments can be understood using 'communities of practice' theory that proposes that learning occurs as individuals become part of communities, and that communities themselves are generated through this participation:

'... learning is not merely situated in practice- as if it were some independently reified process that just happened to be located somewhere; learning is an integral part of generative social practice in the lived world.' (Lave and Wenger 1991, 35)

Lave and Wenger argued that learning happens through interactions with people and things that generate certain ways of being. What matters in any situation is therefore linked to what people do which in turn is upheld by artifacts and architecture that have, over time, been produced to support certain practices: classrooms, furniture, tools, resources, signage, handbooks, and so on. Importantly, knowledge is not fixed but evolves as individuals improvise together - in practice - with what is available and what counts. When using virtual environments in school, therefore, teachers and children learn what is possible as they take up available resources and align with what others are doing. Schooled resources are significant, as are the possibilities for exploration and interaction enabled by virtual environments, and the values and aims of producers and sponsors which, woven into these environments, position children in certain ways and frame what they are able to do (Buckingham and Rodriguez 2013; Black et al 2014). Also significant however are the ways that individuals respond to such environments and relate to one another. In doing so they may generate new ways of 'being together', but may do so by drawing on their experience in other contexts. Marsh's (2011) analysis of children's interactions in *Club Penguin*, for example, showed how children used strategies for managing relationships developed through face-to-face communication, such as turn-taking. Appearing chaotic to the casual observer, children's interactions followed distinct patterns and reflected similar purposes and intentions to interactions off-line. As Marsh summarises, 'social order was constructed through ritualized practices that have their origins in the offline social world' (Marsh 2011, 101).

Importantly, however, the social world is 'characterised by multiple membership' (Barton and Tusting 2005, 25) and different practices over-layer as individuals exist simultaneously within multiple communities. Schools provide rich examples of this (e.g. see Nesper 1997) and indeed Wenger saw schools as such complex sites that he avoided using them as examples in the seminal work, *Communities of Practice*:

'Students go to school and, as they come together to deal in their own fashion with the agenda of the imposing institution and the unsettling mysteries of

youth, communities of practice sprout everywhere – in the classroom as well as on the playground, officially or in the cracks. And in spite of curriculum, discipline, and exhortation, the learning that is most personally transformative turns out to be the learning that involves membership in these communities of practice.’ (Wenger 1998, 6)

Previous research has suggested that the significance of multiple membership is heightened, or at least more apparent, when using digital tools: new affordances facilitate alternate ways of being and the possibility of participating in multiple interactions. Davies’ analysis of young women’s use of Facebook (Davies 2014), for example, problematises the notion of boundaries between on/off-screen worlds. She explores how her participants drew on Facebook to craft identity performances within different relationships, being at once within the site and ‘looking out’ but also materially rooted ‘without’ while ‘looking in’ (Davies 2014, 73). What happens on and off-screen is permeable and enmeshed. When considering virtual environments in classrooms, then, instead of thinking in terms of movements *between* virtual and physical environments it is helpful to think in terms of hybrid on/off-screen sites (Burnett 2014).

This permeability between on/off-screen activity implies that embodied relationships with physical surroundings are relevant to ‘being together’ and such relationships have been examined in studies documenting how play traverses on and off-screen locations. Giddings, for example, explored how two boys’ play in the videogame-world of *Lego Racers* migrated to off-screen play with Lego© on the living room floor, concluding that ‘the virtual and the actual were each contained within the other, intertwining, each inflected by the other’ (Giddings 2007, 46). Leander and Boldt describe similar movements in their account of two boys’ Manga-themed on/off-screen play, highlighting the significance of affect to the improvisational quality of meaning-making and, in doing so, emphasising the ‘sensations and movements of the body in the moment-by-moment unfolding or emergence of activity’ (Leander and Boldt 2013, 25). Other studies have suggested that embodied interactions in classrooms may be associated with coalescences of on/off-screen play that disrupt ‘schooling’ practices (Cowan 2010; Burnett and Bailey 2014). In Cowan’s study, for example, adolescents playing *Webkinz* (Cowan 2010), talked across class and readily moved between their own and others’ screens. The physical stillness more commonly observed in classrooms (Dixon 2011) was unsettled as the adolescents played together on-screen.

This brief review suggests that the notion of changing participation in communities needs to be tempered with recognition that the nature and quality of groupings may shift as the on- and off- screen intersect and inflect one another in different ways. These shifts may evoke, consolidate or disrupt different ways of ‘being together’. In previous writing with Chris Bailey, I explored how children interacted on and off-screen as they built a virtual community using *Minecraft* (Mojang 2010) (Burnett and Bailey 2014). We considered relationships between on- and off-screen happenings and discussed a series of dimensions of ‘being together’ that present collaboration as complex and multi-layered. We described children’s play as ‘fractional’ (Law 2004) in order to capture how it held together different realities. Children, for example acted both on and off-screen, and simultaneously belonged to different communities. They operated across different time-fames and played at once as individuals, groups and whole class. They also interacted with

fractional objects - both on and off screen - which were taken up in different ways at different times. In this article I develop these themes drawing on Schatzki's notion of a practice meshwork to offer a more detailed theorisation of how embodied relations with things in classrooms mediate ways of 'being together' around classroom/virtual environments and how different 'timespaces' (Schatzki 2010) are evoked as children play together on and around screens in class.

2. Investigating 'being together' in the 'site of the social'

Schatzki sees the 'site of the social' as complex. A 'site' for Schatzki, is not just a physical place but is related to other dimensions of experience such as time, power relations and life-course. For Schatzki, any site is traversed by multiple practices which are 'constellations' of 'doings and sayings' in the form of actions, tasks or projects (Schatzki 2002; 2010). He considers context not in terms of a single location but in relation to different 'timespaces' (Schatzki 2010) that are typified by a 'hanging together' of objects and practices. This perspective provides a useful way of conceptualising hybrid school sites. Primary schooling practices in England, including the taking of registers (to check all children are present), lining up for assemblies (whole school gatherings), and writing timed stories for assessment purposes, might for example entangle with friendship practices such as swapping world cup stickers, making loom bands or passing notes.

The practices that form this 'practice meshwork' help construct and are associated with 'arrangements' (Schatzki 2002, 19) of actions, words, doings and things. The primary schooling practices listed above might sit within 'arrangements' of teachers, pupils, whiteboards, textbooks, bookshelves as well as policies and frameworks linked to curriculum, assessment and accountability. Importantly, arrangements exist only through being recognised as such. There is always potential for transformation as objects, people and practices combine (or are perceived as combining) in different ways or are disrupted by something or someone new. Certain arrangements may therefore be recognised or realised when children are together in classrooms, and others may not. Schatzki highlights the significance of the non-human. While he understands practices as purely human enterprises, he sees the objects around us as deeply implicated in what we deem possible and how we make sense of the world: 'The presence of objects both stabilises and regularises doings and sayings as well as objects and tasks' (Schatzki 2002, 107).

In what follows I use Schatzki's ideas to interrogate a four-part story of one classroom episode. Separately the four parts illustrate different dimensions of the practice meshwork inflecting this episode. They foreground different arrangements of objects and practices associated with different timespaces. Together they are intended to suggest how different timespaces may entangle as children manage 'being together' (or apart) and how they may intersect and interfere with each other through a practice meshwork. In particular the four parts highlight how embodied interactions between humans and non-humans may be significant for how different ways of 'being together' (or not) are realised.

3. 'Being together' in an on/off-screen classroom site

The episode is drawn from an 8-month study of technology use in one classroom, during which I observed how a class of 10-11 year-olds created and interacted with one another on and off screen. The children were in their final year of

primary schooling (Year 6) at a small village school in Northern England. Their teacher had developed a strong online presence for the school, and for this class in particular: class blogs displayed children's work and homework tasks; parents commented on what children did; and Twitter was used to keep parents informed about events and activities. Their teacher was also interested in integrating computer games into classroom activity and ran a lunchtime Minecraft Club. The school's set of laptops and iPads were stored in his classroom and consequently the class had access to these devices whenever other classes were not using them. The teacher actively sought to encourage a sense of the class as a close community, respecting and listening to children, making connections with experiences outside the classroom, encouraging children to support each other, and using humour including plenty of shared jokes.

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 hours on 16 occasions. Following Davies (2014), the study had an 'ethnographic texture', drawing on a variety of ethnographic tools to capture the entwined nature of children's on/off-screen activity (Hine 2000): field-notes, video recordings, group interviews, analysis of digital artifacts, and ethnographic interviews as children played and worked. Fieldnotes began as brief scratch notes (Sanjek 1990) written during lessons which attempted to capture how children interacted with one another and with the things (real and virtual) around them. I did not approach these notes as records of objective truths but as positioned and partial perspectives. I recorded my own thoughts, feelings and reactions alongside what, from my perspective, children did. These were developed as more detailed notes soon after each visit, some of which are presented as the narratives in this article. Wary of research that mines classrooms for data with little regard for teachers' perspectives (Comber 2007), I invited the teacher's perspectives on how children made sense of the opportunities he provided and also how lessons observed related to what happened at other times. Post-lesson discussions and email exchanges containing our reflections following lessons provided these perspectives.

I did not try to distil data to summarise dimensions of the experience of this class, as might be attempted through a case study, but used what I saw, heard and felt to think expansively and divergently in relation to what I noticed and recorded (Leander and Rowe 2006). I combined fine-grained analysis of individual incidents (using video data) with a tracing of connections between moves in space and time. I considered children's actions and interactions in relation to what I had previously observed or what they told me about other experiences within and outside school, drawing too on my own experience of this and other school sites. I considered the data from different perspectives, sometimes looking close-up to examine micro-level interactions between children, each other and things around them, and at other times taking a broader view by examining what they did in relation to multiple discourses associated, for example, with gender and schooling. While the study was small and based entirely in school, this analysis foregrounded a series of dimensions of the children's experience that seemed significant for how they played/worked alongside each other in virtual environments in classrooms. In exploring these dimensions, I focus on an episode where children played *Proteus* (Key and Kanaga 2013), a game produced by an independent game-maker.

4. 'Being together'- an episode in 4 parts

The 30 minute episode occurred during a lesson in which the children had been asked to explore *Proteus* as the stimulus for a piece of descriptive writing. *Proteus* is a virtual world of trees, lakes, forests, mountains, inhabited by animals. As players move through *Proteus* this triggers changes in the environment but other opportunities to make things happen on-screen are limited, and the game does not support on-screen interaction, e.g. as avatars and/or through on-screen chat. As the children explored, they heard sounds and encountered natural objects, the sun rose and set and the stars came out. Their teacher asked them to note descriptive phrases to use later in their writing. It is worth noting that my focus here is not the teacher's use of the game or its effectiveness in supporting learning although, as others have argued (e.g. Bate et al 2014; Steinkuehler et al 2012), these are important areas to consider. The teacher was interested in exploring ways of using games to 'enhance' the existing curriculum and to 'transform' learning experiences in the classroom (Burnett et al 2005). In this episode the virtual environment generated by the game was used to 'enhance' a traditional writing activity. None of the children had used *Proteus* before and I was interested in how far their play was infused by practices associated with gameplay with other games.

In what follows I draw on Schatzki's work to map some of the complexities associated with how children related to one another as they managed 'being together' (or not) around *Proteus*. Evoking complexity is difficult in an article; the representation of the world in words involves framing and categorising experience and the linear accounts generated through this process foreground and legitimate certain kinds of realities. My four-part story is intended to disrupt such singularities. The four parts are not intended to present a comprehensive or 'representative' picture of the nuances of 'being together' in this particular class or for individual children, but instead juxtapose a range of dimensions in order to expand ideas of what 'being together' might involve. Each includes a focus on how bodies and things are significant to how different ways of 'being together' are realised for different individuals. Telling the story of this episode in four parts, my narration is in the present tense, not attempting to imply the 'benign, detached and seemingly objective gloss' of the 'ethnographic present' (Jones et al 2011) but to suggest how the event unfolded moment by moment.

It is important to emphasise that as a researcher I was part of the practice meshwork. I interacted with the teacher and children and as such helped to shape what happened. The story therefore is not a 'complete' account and the commentary is tentative and interpretive; it is shaped by what I noticed, deemed worthy to record, and ultimately how I crafted a narrative from my notes. It is intended, as Erickson writes, 'not as a portrayal of what is real; not as a proxy for experience itself; possibly as an image of the real which stimulates reflection and emotion' (Erickson 1978, 185).

In Part A particularly, my positionality is foregrounded as I directly recount my own sensations and impressions while waiting for the children to come in after break (recess) for the start of the lesson. It describes what I saw, felt and smelled. It suggests how, as I spent time in the classroom, I perceived material artefacts as both shaping and coming to represent certain ways of 'being together', as part of the different 'arrangements' associated with children's practices. As will become clear, however, Part A also signals the problems of 'reading' the material environment in

this way and of seeing places, and the communities and practices associated with them, as unitary and fixed. The other parts suggest a greater fluidity and multiplicity. Narrative voice is more covert in parts B-D, although I attempt to acknowledge my positionality by hinting at other stories that could be told about this event. Part B highlights the significance of children's embodied relations with the things around them and how these may be significant to 'being together'. Part C explores how ways of 'being together' can shift, and Part D illustrates how children may be positioned in different ways as they improvise differently with each other and the things around them. While presented sequentially, I invite the reader to read the four parts as over-layered, to read each story 'through' the previous stories. In the final part of this article I consider in more depth the implications of holding together the different realities that these different parts present, and of using these to hypothesise other realities that there is no space to explore here.

Part A: Locating the site of the social?

It's January and there's snow on the ground outside. The main windows in the classroom look onto an internal corridor in this small rural school. External windows are in two small alcoves, one of which is used as a reading area. This means that the main body of the classroom is quite dark - even darker when the children are asked to focus on the interactive whiteboard screen and the lights are turned off. Surfaces are smooth and unforgiving. The floor, the vinyl table top and the polyurethane chair seats are all wipe-clean and standard size; smaller children have to sit up straight to work on tables, taller ones hunch over. The smell is evocative of many schools I have been in, particularly in winter - a stuffy combination of heat, too many bodies and damp clothes.

If a place is as Castells (1996) writes, a 'gathering', then this classroom perhaps becomes a place through its gradual accumulation of things - 'layered sedimented materials' (Lawn 2005, 145) - which trace the collective experience of the class to date, or at least part of that experience. Some objects are mementos: wall displays document class trips and topics explored. Notices describe, remind and instruct - referencing other lessons and ongoing or past learning aims. Some are lists of features of the kinds of texts children will need to re-create during high-stakes assessments they'll do at the end of the year. Other objects are used during routine activities, sometimes frequently such as pencils, rulers, laptops, and sometimes only occasionally such as coloured pens and card.

Most objects are communal, their use overseen by the teacher. A few are allocated to individuals, e.g. workbooks or trays, but this ownership is temporary. Workbooks are jointly owned by the teacher who monitors their use, decides what will go in them and when and where they are stacked away. The children have 'places' in the classroom - seats where they usually sit, but these aren't permanent: sometimes children get to choose where to sit, and sometimes the teacher asks them to sit with other children for specific activities. The children's trays are on runners underneath the tables at their 'places'. Their teacher leaves them to manage these - some barely shut, full to the brim with notes, pieces of writing, plans, personal mementos, pencil cases and books. The books are their 'reading books' accessed at specific allocated reading times. Some objects - books the children swap between themselves, an accordion on top of the computer trolley used for class singing - suggest the sense of community I have always felt in this classroom.

With the children absent, my account focuses on the architecture and objects within the classroom. However, as is evident in the parts that follow, this ‘stuff’ (Miller, 2010) hints at the practice-meshwork I associated with the class. In my narrative I present ‘school’ as separate from the world outside, held in by its walls. Children may look out of windows at the hills and settlements surrounding the school but rarely do and many of the people and objects gain specific schooled meanings as perceived as part of arrangements: ‘adults’, ‘children’s novels’ and ‘tables’, for example, become ‘teachers’, ‘reading books’ and ‘desks’. I note how things help direct attention, working deictically to filter specific learning points from the multitudes of other foci and possibilities that might be generated with what is available. These things prompt certain arrangements of bodies. The signs, the workbooks, the lighting state that focused attention on the interactive whiteboard, and the furniture arranged so children faced the board. These things, and the embodied relations associated with them, arise from and reinforce ‘doings and sayings’ associated with learning that is teacher-directed and managed, aligned perhaps to the focus on measurable attainment and visible progress prevalent in many schools in England as a result of accountability frameworks. At the same time, the ‘stuff’ I describe suggests other constellations of doings and sayings - the accordion and shared books evoked, for me, a sense of togetherness that contrasts with an emphasis on individual attainment and managed progress.

I reiterate here that these reflections are selective and interpretive. As hinted at in my references to other classrooms, I saw what was there in relation to other schools I have visited or worked in: I notice and foreground classroom smells as they remind me of other classrooms. Others, with other experiences, may have noticed, and noted, other aspects. I also mention *‘the sense of community I have always felt in this classroom’*, referring to what Anderson (2009) called ‘affective atmosphere’. As an ex-teacher, the accordion evokes images of ‘being together’ for communal singing, and as someone who has spent time in this particular class, I read it in relation to all the other ‘community-minded’ activities that their teacher promoted.

The things described may well have helped ‘prefigure’ (Schatzki 2010) what children and adults did in this class but different kinds of doings and sayings may also have jumbled together differently for different individuals (including me), like the contents of the trays under the children’s desks, a melange of the official and unofficial, the institutional and the locally instantiated. As Schatzki (2002, 154) writes,

‘...practices and orders are not just contingently but also precariously and incompletely packaged into bundles. Indeed the very notion of a ‘mesh’ of practice and orders is meant to suggest that activities and arrangements form a great evolving horizontal web of interweaving practices amid interconnected orders. Whatever consolidations of practices and orders occur in this mesh are contingent, regularly disrupted, and always perforated by the moving rhizomes of dispersed practices that lace through the social site.’

Arrangements are likely to prefigure what happens and are consequently significant to thinking about how children interact around virtual environments in classrooms and manage tasks together. However, prefigurement can relate to different practices and orders. The ‘schooled’ ways of being implied by the objects in the classroom do not necessarily dominate. In Part B, I tell a story of what happened as two boys

began to explore *Proteus* and how children's embodied interactions with each other and the stuff of the classroom both reflected and sustained certain ways of 'being together'.

Part B: Settling to work together

I sit behind two boys. Josh and Luke are sitting at a PC in the reading area next to two girls - Lizzy and Kirsty - at a second PC. This feels slightly off the main drag, and it's easy to forget the other children in the main part of the classroom, even though they are only a few feet away. The computer Josh and Luke are using is on a low table, so they must lean over to use it. Josh clicks on the Proteus icon. Proteus is slow to load and the two boys lean back in their chairs as they wait for it to do so (a movement I have often noticed as a program loads). As the strange world appears on-screen, they lean forward again and start to move through it, Josh uses the mouse to propel them forward. He comments that 'the controls are inverted' and that unlike in Minecraft [which they play at home and in school during Minecraft Club], 'left's right and right's left'. The mouse and keyboard take up most of the table, so it's hard to find room for the paper Luke is using to take notes. At one point, he stands and places the paper on Josh's hunched back and writes on it there. This isn't mentioned. Josh, continuing to move through the world, occasionally dictates (in a monotonous voice) a phrase for Luke to write: 'I could feel the ground crunching under my feet'. Sometimes Luke writes these phrases verbatim saying them out-loud as he does so. Sometimes he alters them, perhaps mis-hearing or perhaps toning them down, 'The island is littered with cathedrals', for example, becomes 'The island has a lot of cathedrals'.

In this part of my story, Josh and Luke quickly settled to the task in hand. As in Part A, my narration implies how I perceive things in the classroom as 'schooled' as I see them in arrangements with other things - the books and shelves become a 'reading area' for example - and children are sorted into 'girls' and 'boys' (gender remaining a dominant criterion for sorting individuals in educational and other institutions). I note how, with minimal input from his teacher, Josh generated a series of descriptive phrases, and that he knew from previous lessons what was expected, quickly composing the figurative, evocative phrases that children of this age group must use to demonstrate high levels of achievement in writing as defined by assessment benchmarks in England.

I see their togetherness as not just constructed through talk but through gesture and posture: as Luke rested the paper on Josh's back, for example, and as they mirrored each other, leaning forward and back in unison as the program loaded (see Taylor 2014). At the same time, I present each boy as relating differently to the texts, both on and off-screen. Sitting in the chair facing the screen and holding the mouse, Josh dominated both on and off-screen texts, determining where he and Luke would go in *Proteus* and, through his dictation, what was recorded on paper. Standing and leaning on Josh, Luke appears peripheral and as intermediary, only asserting himself through the tiny alterations he made to Josh's script. At the same time, I present them as exploring *Proteus* together, even though it is Josh alone who controlled the mouse: '*Josh uses the mouse to propel them forward*'. In my reading (and subsequent telling) of what happened, they were together on screen, even

though they played very different roles in achieving this. I read them as both ‘being in’ Proteus as well as ‘in’ the classroom.

Seeing this episode in terms of entanglement within a ‘practice meshwork’ involves seeing what happened in relation to what has happened before and/or what will come next. An enduring feature of the site of the social in schools is that learning is often planned for or measured in terms of discrete segments – lessons, units of work, school years, and so on. As Compton Lilly (2013, 84) writes, ‘time is an inextricable aspect of the context in which people exist, operate and construct understandings of the world and themselves.’ Official markings of time are important here in privileging certain ways of ordering and demarcating ideas about success, failure and progress. My narrative, for example, suggests the significance of Josh’s interaction with Luke and his orchestration of the ‘successful’ descriptive writing, as ‘able’ reader and writer. At the same time, there is a kind of ‘heterochrony’ (Lemke 2000) as the episode could also be seen in relation to other timescales, such as those associated with Luke and Josh’s friendship, or experience of gaming, or of ‘working’ together. For example, I note how they used approaches honed in other gaming environments to work out how to navigate *Proteus*: Josh explained the controls to Luke in terms of their shared experience of *Minecraft*. Similarly I read Josh and Luke’s physical positioning and division of labour in relation to their long-established patterns of working together in class. Classroom events such as this one seem to exemplify a kind of ‘layered simultaneity’ (Blommaert 2005) in which things happen at the same time but in multiple layers; events work across multiple timescales.

It is unclear whether Josh reeled off descriptive phrases in the disinterested way suggested by his monotonous voice because he only composed them to please his teacher, or whether he played them down to avoid conveying too much enthusiasm for composition tasks. As I present them, however, their game-play and schooled literacy practices seem to reinforce each other: the confidence with which they explore *Proteus* enables the experience that prompts the paper-based writing. The gameplay practices and schooling practices seem to entangle with each other and with other practices. Schatzki (2010, 68) argued that, ‘interwoven timespaces are often responsible for the sinews through which people coexist’ and it may be the relationship *between* timespaces that framed how these two boys approached the task together. In Part C, I narrate how their actions played across the wider class, illustrating how groupings can shift in an instant.

Part C: Playing the game in the text

At one point, I see Josh press the escape button - by mistake, I think, although of course it may not have been - and the image on screen shrinks into an elliptical eye shape. Josh seems delighted - ‘it’s winking’- but the eye keeps shrinking and eventually disappears and the screen goes black. Josh and Luke have exited the program. Both boys gasp in alarm, leaning back and throwing up their arms, but horror rapidly turns to delight and they lean forward again to utilise their discovery, Josh telling Kirsty, ‘Press Escape – you can make it wink’. She does this and almost immediately leans back and gasps in horror too. Luke turns round and calls across the classroom urging others to press escape to ‘turn it into a magic eye’ or ‘if you hold down escape, it’ll take you to a magical world’. Josh and Luke laugh when others caught out by the trick also exclaim. Then, the program re-loaded, they

resume their exploration and Josh continues dictating: 'peaceful sounds of serenity', 'We can smell the soft aroma as the crabs crawl along the shore...'

This part of my story suggests how Josh and Luke momentarily re-framed the task, finding a way to 'play' the game that went beyond navigation of the environment. I suggest that their use of the 'kill' button (as they later dubbed it) subverted *Proteus* and allowed them to play for a moment in ways more similar to how they played other games at home. As explored in more detail below, the impact of this play seemed significant in how it was felt *in the class* rather than on-screen. I noted this ludic dimension in many of my observations of Josh and Luke's encounters with texts at school. For example, *Minecraft* was only permitted in Creative mode in Minecraft Club, but they often played in ways more appropriate to Survival mode, using available resources to kill and destroy. Like those Cross (2008) observed, children in this class seemed to carry attitudes and practices associated with gaming into other activities.

I noted that children frequently used others as instant audiences and their on-screen actions often seemed intended to amuse or support their peers in the moment, rather than achieve the outcome expected by the teacher. As such they seemed to me to be not just to be creating texts, but forging and cementing relationships. Josh and Luke appeared to take up *Proteus* in relation to a mesh of schooled and non-schooled and official and unofficial practices, inflected variously by their prior and ongoing experiences with and around games as well as those of the classroom. As Beavis and Charles note (2005, 359),

'Game play is not only about the game. The context for game play and the histories, agendas, relationships, expectations and experiences of game players all also influence the ways the game is played and the meanings players take and make from the game.'

In considering how these different practices and arrangements are foregrounded and backgrounded in my narrative, it is worth noting how the locus of activity shifted once the boys discovered the 'kill' button. In Part B, I present the locus between the two boys and the screen. In Part C, however, as the program crashes and they lean back (mirroring each other), the relative salience of on-screen and off-screen activity seemed to shift. The invisible thread joining bodies to screen broke and I present them as re-connecting with others in the class. The forced crashing prompted others too to exit the world, momentarily generating a 'community' of failed *Proteus* players, very much off - not on - screen. Just as many jokes rely on modal shifts, here the ejection from on-screen to off-screen relied on a shift in 'modal intensity' (Norris 2004, 79) as 'being together' physically was foregrounded in place of on-screen exploration. Their embodied togetherness mattered to what happened and the dyadic organisation dissolved as Josh and Luke's use of the 'kill' button rippled across the class.

My story suggests that the boys' (particularly Josh's) ability to effectively navigate schooling/gaming/friendship practices enabled them to leverage social and academic capital to succeed in different arenas. In Part D I focus on one child to illustrate how others seemed less confident, competent or keen to make these kinds of shifts, and seemed to be positioned, or position themselves, differently as they responded to being alongside others.

Part D: 'Being together' (or apart)

I notice that Lizzy and Kirsty are also moving through Proteus. Kirsty has the mouse. She encounters what looks like a spinning ring of white lights - 'it's magic'. Luke looks across, telling her to, 'step into it', then takes her mouse and uses it to move her into the circle, at which point a new location appears on her screen. Luke leans back, telling Josh, 'Look, it makes her jump...It's a teleporter.' Josh tries to find the spinning tyre in the world on his screen.

Kirsty continues moving through the world but Lizzy, without the mouse, leaves the PC and goes to stand by the bookshelf behind the computers. She places her paper on top of the bookcase and starts writing. Occasionally she looks across at the screen, and sometimes at the interactive whiteboard where the game's also projected. Sometimes she gazes out the window, turning back to her paper after a few moments to write another sentence. Every now and again, Kirsty calls across to Lizzy, commenting on what she's found - 'Look there's fireflies', 'I'm on a hill' - but for the most part, the two girls, physically distant, act separately, Lizzy rhythmically shifting between gazing and writing.

As in Part C, in Part D I present the dyads as porous. I note how Luke, for example, took Kirsty's mouse to manage her on-screen journey, and how her discoveries gave him ideas about what to do when he returned to his own screen. However these interactions did not necessarily involve the convergence that seemed to emerge in the shared experience of crashing as described in Part C. Luke invaded Kirsty's space, but read what was on-screen differently to her. I contrast how he saw objects in the on-screen environment in terms of what they might do, spotting that the spinning ring was a potential 'teleporter' - with how Kirsty described it in storied or thematic terms - it's 'magical.' They sat next to each other, sometimes noticed what was on each other's screens, and sometimes, as Luke did here, did things that affected what happened on those screens, but they did not seem to share the same purposes or interpret what happened in on/off-screen spaces in similar ways. Meanwhile Lizzy moved away from Kirsty, disrupting the dyad. It is not clear from my story, and I did not know at the time, whether she did this to focus on her writing, or because she could not or did not want to joke with the others, but she moved apart and worked alone, observing *Proteus* from a distance via the large screen rather than travelling through it. The 'desk' she improvised from the bookcase worked differently to the one Luke improvised from Josh's back. Luke's enabled him to stay with Josh, while Lizzy's enabled her to set herself apart. Kirsty meanwhile worked to maintain the connection, keeping Lizzy updated on what happened on screen. Different ways of 'being together' were mediated/generated by different embodied relationships with each other and the things (screens, desks, bookcases) around them.

An important dimension of the 'practice meshwork', as Schatzki describes it, is the existence of 'teleoaffective regimes' (Schatzki 2002, 81) which relate to how things matter to people and are bound up with feelings. A dominant teleoaffective regime in this class - as I felt it - was apparently linked to responsibility to others and working together and a sense of community. My story implies that different teleoaffective regimes came to the fore as children worked out how to be with one another. Luke and Josh's actions in Part C seemed to be about humour while Lizzy's actions in Part D seemed aligned to something different, perhaps the reassuring and

maybe gendered work of being a good pupil, or a preference for the peacefulness of working individually and alone, or maybe a sense of exclusion from the playful joking between Luke, Josh and Kirsty.

5. 'Being together' as entangled with multiple practices

In telling the four parts of this story, and focusing particularly on interactions between bodies, things and texts, I attempt to avoid the kind of, 'representational logic' that, Leander and Rowe (2006, 432) argue, 'over-emphasises stability, structure, and repetition and underemphasizes the change, diversity, and innovation that are part of literacy in use.' I attempt to disrupt any sense of unity here by shifting the focus of my story and, drawing on Schatzki's work, trying to tease out how children's 'being together' worked across multiple timespaces. The four-part story clearly does not provide a complete account, but does I suggest, present diverse ways that children may navigate the material realities of 'being together' with peers around computers in classrooms and suggests how different practices may be enmeshed as they do so. If we read Part B 'through' Part A, for example, we have to hold together different ways in which these children are 'together'. Self-consciously positioned, partial and incomplete, the parts of my narrative may also have prompted the reader to consider other perspectives or stories that would have foregrounded other practices. I suggest therefore that collaboration around virtual environments (or perhaps any environments) does not just sit within the spatially and temporally framed chunks presented during the school day. 'Being together' is entangled in multiple practices. Children's 'togetherness-withness' (Schatzki 2010, 66) operates in multiple timespaces: short term, long term, official, schooled, and not schooled for example. These are brokered through diverse embodied relations with the material environment and these varied relations are significant to, and reflect, different kinds of purposes and preferences. Importantly, in terms of thinking about collaboration, the four parts of this story do not exemplify the activities of a closed community of practice, but a shifting, layered sense of 'being together'. They illustrate various ways in which children's 'being together' is inflected by practice-meshworks and, I suggest, provoke five inter-linked propositions for promoting and researching collaboration:

1. 'being together' matters.
2. Interactions are complex and fluctuating.
3. Multiple groupings play out in children's interactions.
4. Relationships work across multiple planes of meaning-making.
5. Children are positioned in different ways by themselves, by others and by things.

1. *'being together' matters.* Learning in this particular class - whether or not it involved digital technologies – might be seen as inflected by a teleoaffective regime which valued sharing, caring and collaboration. As in Wohlwend et al's (2011) analysis of children's play in Webkinz in an after-school club, the children in the present study could to some extent be seen as operating as a community of practice; they found ways of 'being together' around virtual environments through watching others' screens and learning how to navigate and manage on-screen actions as they attempted to explore a virtual environment together. However, there appeared to be

other nuances to how they played and worked alongside each other that were not accounted for by these models of learning and community and which seemed to suggest other dimensions of 'being together'. Specifically, the 'affective intensities' (Leander and Boldt 2013) generated in the moment, for example associated with friendships and humour, appeared to inflect, and sometimes distort, activity related to other purposes, as did less positive feelings such as irritation or rejection.

2. *Interactions are complex and fluctuating.* The resources children chose to use and the way they engaged with tasks often appeared to be associated with relationships. Close friends had developed shared ways of 'being together' that mapped onto classroom activities. However, while friendship (and perhaps sometimes enmity) appeared significant, different groupings and purposes manifested in different ways at different times. Groupings were often fluid, emerging and dissolving as the need arose, similar perhaps to Gee's 'affinity groups' (Gee 2007) or Engestrom's 'wildfire activities' (Engestrom 2009) through which people congregate briefly face-to-face or online to share enthusiasm or expertise and then disperse. In school, collaboration is often officially managed in fixed groups within defined spaces and times and directed towards finite shared outcomes. This example illustrates how children may move in and out of groupings. Objects (on-screen and off) may be significant here offering up different possibilities for 'being together' (or apart). In thinking about these shifts in groupings it is tempting to think in terms of cause and effect, for example, that one person's actions stimulates what another does. It may be however that interactions between people and the people and/or things around them are better understood in terms of a coalescence of different moves, rather than a sequence. In problematizing the term 'interaction', Ingold writes,

'The implication of the prefix 'inter'-, in 'interaction, is that the interacting parties are closed to one another, as if they could only be connected through some kind of bridging operation. Any such question is inherently detemporalising, cutting across the paths of movement and becoming rather than joining along with them. In correspondence, by contrast, points are set in motion to describe lines that wrap around one another like melodies in counterpoint. Think, for example, of the entwined melodic lines of the string quartet. The players may be seated opposite one another, and their bodies fixed in place. But their movements and the ensuing sounds correspond, seeking a blend not unlike that of Donne's souls in ecstasy, neither here nor there but in-between.' (Ingold 2013, 107)

In thinking about interactions as complex and fluctuating, it may be helpful to think of them, as Ingold does (2013), as 'correspondence' or 'blend.'

3. *Multiple groupings play out in children's interactions.* Classes or schools are often referred to as single communities and the drive to generate supportive and collaborative classroom communities is a common priority for teachers. Classroom ethnographies have unsettled this idea by highlighting the complexity of classroom life (Nespor 1997, Maybin 2006), suggesting that children work across multiple, fluctuating groupings which inflect - sometimes reinforcing and sometimes undermining - the 'imagined community' (Anderson 1983) of the class. As well as being multiple and over-layered, groupings also form in different ways for different purposes and over different timescales. Drawing on a study of collaborative writing, Kumpulainen et al (2014) have described this multiplicity in terms of 'novel time and

space configurations' (2014, 70). Interactions are related rhizomatically to events and experiences in other times and places, which materialise through embodied interactions with other people and things. These entanglements may reflect the formation (and sometimes disruption) of different groupings as children come together and work apart in different ways. Schooled/unofficial practices crystallise differently for different individuals at different moments. As they find ways to be together, they may therefore work across different timespaces and bring different teleo-affective structures to bear on what they do and their interpretation of what others do.

4. *Relationships work across multiple planes of meaning-making.* In *Proteus*, children drew on a range of on/off-screen moves in multiple modes as they managed 'being together'. Embodied interactions within and with the material environment were entangled with speech and on-screen action, and on-screen and off-screen moves were variously foregrounded and backgrounded. While research into collaborative learning has tended to focus on the role of dialogue (e.g. Mercer and Hodgkinson 2008), these insights add to calls for seeing classroom interaction, and the learning associated with this, as managed through multiple modes (Taylor 2013). This in turn raises questions about the *availability* of different modes. Other studies have highlighted how the affordances of classroom spaces have restricted or enhanced children's interactions using digital technologies (Wohlwend et al 2011; Thibaut et al 2014). This example adds to such analyses by exploring how children's practices in this class meshed with practices associated with other times and places and how these entanglements were significant to what they did with the affordances available to them. Josh and Luke found ways of utilising the affordances of *Proteus* to engage in a game-like play never intended by their teacher or the game designer, while Lizzy improvised a workspace from a bookcase when her usual workspace became colonised by gameplay. Different modes were foregrounded and backgrounded (Norris, 2004) for different children. There is much still to be learned about how these modal shifts happen. However they are important. As Martin et al (2011) suggest, the ability to play across these different 'layers of presence' on and off-screen appears to be central to successful negotiation of on-screen environments.

5. *Children are positioned in different ways by themselves, by others and by things.* What children do on and off screen has implications for their own and others' identities and relationships, and some children are more expert than others in navigating available positions. For Schatzki (2002), people and things come to mean through their engagement with practices, so people construct identity through doings and sayings. Luke, Josh, Lizzy and Kirsty were each positioned, or positioned themselves, differently as they navigated the mesh of practices associated with the on/off-screen classroom environment. Any consideration of collaboration therefore needs to recognise who children are able to be and become as they navigate the mesh of practices generated as they manage 'being together' in the classroom. Gee (2000) has argued, in a critique of the application of communities of practice theory to educational and other institutions, that those skilled at moving between the different identities associated with different communities (whom he terms 'shape-shifting', 'portfolio' people) are those most likely to gain social and economic success in an era of fast capitalism. Education, Gee proposes, must enable all to navigate multiple identities but also validate diverse ways of being and retain a critical stance on how existing communities uphold inequity. It is necessary to consider how

children position themselves and get positioned in different ways, and explore who is advantaged and disadvantaged by specific opportunities for collaboration, and how this happens.

Conclusion

Arguments about the relationship between communities and learning have been well and frequently made. Revisiting these ideas however is important given the often unproblematised argument that digital technologies facilitate collaborative, participatory approaches that have the potential to support learning. This article contributes to thinking about collaboration in classroom/virtual environments by arguing that educators and researchers need to take account of different ways that children manage the process of 'being together' at the interface of the physical and virtual. Children's interactions, as illustrated by this episode, can usefully be seen as entangled with a practice meshwork. Using Schatzki's work as a lens sensitises us to the variety of practices that may mesh together at any moment such as schooling practices, friendship practices, or practices associated with communities - longstanding or ephemeral - developed within and/or outside school. The 5 propositions about 'being together' expand on different ways that this is manifest and/or why this is important to take into account.

This perspective is relevant to both researchers investigating how children negotiate learning in classrooms and educators planning to promote collaboration. For researchers it suggests that understanding collaboration involves both drilling down into the detail of how children relate to one another, as in the fine-grained analysis of children's interactions with people and things, and broadening out to think expansively about how these interactions are inflected by other groupings: large and small scale (from those associated with institutionalised education, for example, to local and personal relationships); transitory (like the momentary convergence that happened around the kill button) and more long-lasting (like the classroom community described in this article or the community of 'good girls' with which Lizzy perhaps aligned herself). For educators it suggests that, if children are to be supported to be together in ways that are empowering and generative when working in on/off-screen environments, then consideration needs to be given to how these dimensions are realised differently for different individuals. There is a need to better understand how individuals manage and choreograph 'being together', and how they hold together or apart different groupings or 'communities' as they do so.

A focus on collaboration as entangled with a practice meshwork highlights these concerns by interrogating some of the threads that join classroom practices to other practices working across temporal, spatial and contextual boundaries. The dyadic and small group work that typifies classroom collaboration in England and other countries might then be seen as rhizomatically related to other practices which operate within different time-scales and across different spaces, and are associated with varied political, economic, social and cultural drivers. As well as illuminating possible inequities, this perspective has potential to highlight new possibilities for ways of 'being together' in classrooms. As Schatzki argues arrangements only exist through perceptions and there are multiple arrangements in any site (see Schatzki 2002: 46). It is possible to generate alternative ways of conceptualising and supporting the process of 'being together' by considering how things, people and practices come together in different arrangements. There is a need to think

expansively about how different articulations transpire, come to matter, and ultimately dissolve. A perspective which sees collaboration as entangled with a practice-meshwork, and which acknowledges the five related propositions outlined above, provides one starting point for such work.

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References

- Anderson, B. 1983. *Imagined Communities*. London: Verso.
- Burnett, C., Dickinson, P., Merchant, G., and Myers, J. (2005). "Digital Connections: transforming literacy in the primary school." *Cambridge Review of Education* 36 (1): 11-29.
- Burnett, C. (2014). "Investigating pupils' interactions around digital texts: a spatial perspective on the 'classroom-ness' of digital literacy practices in schools." *Educational Review* 66 (2): 192-209.
- Burnett, C. & Bailey, C. (2014). "Conceptualising collaboration in hybrid sites: playing *Minecraft* together and apart in a primary classroom." In: Burnett, C., Davies, J., Merchant, G. & J. Rowsell. (Eds.) *New Literacies Around the Globe: Policy and Pedagogy*. Abingdon, Oxon: Routledge.
- Barton, D., and Tusting, K. 2005. *Beyond Communities of Practice: language, power and social context*. Cambridge: Cambridge University Press.
- Bate, F., MacNish, J., and Males, Stven. 2014. "The politics of gaming in schools: a sociocultural perspective from Western Australia." *Learning, Media and Technology* 39 (3): 306-327.
- Beavis, C., and Charles, C. 2005. "Challenging notions of gendered game play: teenagers playing *The Sims*." *Discourse: studies in the cultural politics of education*, 26 (3): 355-367.
- Black, R. , Korobkova, K. & Epler, A. 2014. "Barbie Girls and Xtractaurs: Discourse and identity in virtual worlds for young children." *Journal of Early Childhood Literacy*, 14(2): 265-285.
- Blommaert, J. 2005. *Discourse*. Cambridge: Cambridge University Press.
- Buckingham, D. & Rodriguez, C. 2013. "Aprendiendo sobre el poder y la ciudadanía en un mundo virtual/Learning about Power and Citizenship in an Online Virtual World." *Comunicar*, 20(40): 49-58.
- Castells, M. 1996. *The Information Age*. Oxford: Blackwell.
- Charmaraman, L. 2013. "Congregating to create for social change: urban youth media production and sense of community." *Learning, Media and Technology* 38(1): 102-115.

- Comber, B. 2007. "The work of women teachers in primary literacy education: knowing and doing." *English in Education*, 41 (2):7-26.
- Compton-Lilly, C. 2013. "Temporality, trajectory, and early literacy learning." In *Children's Literacy, Learning and Culture* edited by Kathy Hall, Teresa Cremin, Barbara Comber, and Luis Moll, 83-95. Oxford: Blackwell.
- Cowan, J. 2010. "Webkinz, blogs, and avatars: lessons learned from young adolescents." In *Adolescents' Online Literacies: Connecting classrooms, digital media, and popular culture* edited by Donna Alvermann, 27-50. New York: Peter Lang.
- Cross, B. 2008. "Mimesis and the spatial economy of children's play across digital divides: what consequences for creativity and agency?" In *Play, Creativity and Digital Culture* edited by Jackie Marsh, Muriel Robinson, and Rebekah Willet, 125-144. London: Routledge.
- Davies, J. 2014. "(Im)material girls living in (im)material worlds: identity curation through time and space.. " In *New Literacies around the Globe* edited by Cathy Burnett, Julia Davies, Guy Merchant, Jennifer Rowsell, 72-87. London: Routledge.
- Dixon, K. 2011. *Literacy, Power and the Schooled Body*. London: Routledge.
- Dyson, A. H. 2003. *The brothers and sisters learn to write: Popular literacies in childhood and school cultures*. New York: Teachers College Press.
- Engestrom, Y. 2009. "Wildfire Activities: new patterns of mobility and learning." *Journal of Mobile and Blended Learning* 1 (2): 1-2.
- Erickson, F. 1979. "Mere Ethnography: some problems in its use in educational spaces." *Anthropology and Education Quarterly*, 10(3): 182-188.
- Facer, K. 2011. *Learning Futures: education, technology and social change*. Abingdon, Oxon: Routledge.
- Gee, J.P. 2000. "New People in New Worlds: networks, the new capitalism and schools." In *Multiliteracies* edited by Bill Cope and Mary Kalantzis, 43-68. London: Routledge.
- Gee, J.P. 2007. *What Video Games Have to Teach Us About Learning and Literacy*. 2nd edition, New York: Palgrave MacMillan.
- Giddings, S. 2007. "Studying virtual and actual play." In *Growing up online: young people and digital technologies* edited by Sandra Weber and Shanly Dixon, 35-48. New York: Palgrave Macmillan.
- Hine, C. 2000. *Virtual Ethnography*. London: Sage.
- Hollett, T. & Ehret, C. 2014. "Bean's World: (Mine)crafting affective atmospheres for gameplay, learning, and care in a children's hospital." *New Media and Society*. Available online: <http://nms.sagepub.com/content/early/2014/05/09/1461444814535192.abstract> .
- Honan, E. 2008. "Barriers to teachers using digital texts in literacy classrooms." *Literacy*, 42(1): 36-43.
- Hull, G., and Stornaiuolo, A. 2014. "Cosmopolitan literacies, social networks, and "proper distance": Striving to understand in a global world." *Curriculum Inquiry* 44(1): 15-44.
- Ingold, T. 2013. *Making*. London: Routledge.
- Jones, L., Holmes, R., Macrae, C., and Maclure, M. 2010. "Documenting Classroom Life: how can I write about what I am seeing." *Qualitative Research*, 10 (4): 479-491.
- Key, E., and Kanaga, D. 2013. *Proteus*. Available at <http://www.visitproteus.com/>.

- Kumpulainen, K., Mikkola, A. & Jaatinen, A. 2014. "The chronotopes of technology-mediated creative learning practices in an elementary school community." *Learning, Media and Technology*, 39(1): 53-74
- Lave, J., and Wenger, E. 1991. *Situated Learning: legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Law, J. 2004. *After Method: mess in social science research*, London: Routledge.
- Lawn, M. 2005. "A Pedagogy for the Public: the place of objects, observation, mechanical production and cupboards." In *Materialities of Schooling* edited by Martin Lawn, and Ian Grosvenor, 126-145. Didcot: Symposium Books.
- Leander, K. & Boldt, G. 2013. "Rereading "A Pedagogy of Multiliteracies": Bodies, Texts, and Emergence." *Journal of Literacy Research*, 45(1): 22–46.
- Leander, K. and Rowe, D. 2006. "Mapping literacy spaces in motion: A rhizomatic analysis of a classroom literacy performance." *Reading Research Quarterly* 41(4):428-460.
- Lemke, J. 2000. "Across the scales of time; artifacts, activities and meanings in ecosocial systems." *Mind, Culture and Activity*, 74(4): 273-290.
- Lynch, J. & Redpath, T. (2014). "'Smart' technologies in early years education: A meta-narrative of paradigmatic tensions in iPad use in an Australian preparatory classroom." *Journal of Early Childhood Literacy*, 14(2):147-174.
- Martin C., Williams, C., Ochsner A., Harris, S., King, E., Anton, G., Jonathon Elmergreen, J., and Steinkuehler, C. 2012. "Playing together separately: mapping out literacy and social synchronicity." In *Virtual Literacies: interactive spaces for children and young people* edited by Guy Merchant, Julia Gillen, Jackie Marsh, and Julia Davies 226-243. New York: Routledge.
- Marsh, J. 2011. "Young Children's Literacy Practices in a Virtual World: Establishing an Online Interaction Order." *Reading Research Quarterly*, 46 (2) : 101-118.
- Marsh, T. 2005. Vicarious experience: Staying there connected with and through our own and other characters. In *Gaming as culture: Social Reality, identity and experience in role-playing, collectible, and computer games* edited by P. J. Williams, 196– 213. Jefferson, NC: McFarland
- Maybin, J. 2006. *Children's Voices: Talk, Knowledge and Identity*. Basingstoke: Palgrave.
- Mercer, N. & Hodgkinson, S. 2008. (Eds.) *Exploring Talk in School: inspired by the work of Douglas Barnes*. London: Sage
- Merchant, G. 2009. "Literacy in virtual worlds." *Journal of Research in Reading*, 32 (1): 38-56.
- Merchant, G. 2010. "3D Virtual worlds as environments for literacy teaching." *Education Research* 52 (2):135-150.
- Merchant, G, Gillen, J., Marsh, J. & Davies, J. (Eds.) 2011. *Virtual Literacies: Interactive Spaces for Children and Young People*. New York and London: Routledge.
- Miller, D. 2010. *Stuff*. Cambridge: Polity.

- Ito, M., Gutierrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., Schor, J., Sefton-Green, J. & Watkins, C. 2013. *Connected learning: An agenda for research and design*. [Online] Available at <http://dmlhub.net/publications/connected-learning-agenda-research-and-design> .
- Mojang. 2010. *Minecraft* [Online] Available at <https://minecraft.net/>.
- Nespor, J. 1997. *Tangled Up in School: politics, space, bodies, and signs in the educational process*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Norris, S. 2004. *Analyzing Multimodal Interaction*. London: Routledge.
- Sanjek, R.1990. A vocabulary for fieldnotes, in *Fieldnotes: the making of Anthropology* edited by R. Sanjek, 920-921. Ithaca, NY: Cornell University Press.
- Schatzki, T. 2002. *The site of the social*. University Park, Pennsylvania: Pennsylvania University Press.
- Schatzki, T. 2010. *The Timespace of Human Activity*. Plymouth: Lexington Books.
- Schwartz, L., DiGiacomo, D. & Gutierrez, K. 2013. Diving Into Practice with Children and Undergraduates: A Cultural Historical Approach to Instantiating Making and Tinkering Activity in a Designed Learning Ecology International Conference of the Learning Sciences (ICLS), Boulder, CO.
- Scollon, R. 2001. *Mediated discourse: The nexus of practice*, London: Routledge.
- Steinkuehler, C, Squire, K. & Barab, S. 2012. *Games, learning, and society: learning and meaning in the digital age*. Cambridge: Cambridge University Press.
- Taylor, R. 2013. "Meaning in, between and around words, gestures and postures: multi-modal meaning making in children's classroom discourse." *Language and Education*, 28 (5): 401-420.
- Thibaut, P., Curwood, J., Carvalho, L. & Simpson, A. 2014. "Moving across physical and online spaces: a case study in a blended primary classroom." *Learning, Media and Technology*. [Online.] Available at <http://www.tandfonline.com/doi/abs/10.1080/17439884.2014.959971#.VSf6WOk8YdU> .
- Wohlwend, K, Zanden, S., Husbye, N. & Kuby, C. 2011. "Navigating discourses in place in the world of Webkinz." *Journal of Early Childhood Literacy*, 11, 2:141-163.
- Wolfe, S. and Flewitt, R.S. 2010. "New technologies, new multimodal literacy practices and young children's metacognitive development." *Cambridge Journal of Education*. 40 (4):387-399.
- Wenger, E. 1998. *Communities of practice: learning, meaning, and identity*. Cambridge: Cambridge University Press.