The Routledge Handbook of Digital Literacies in Early Childhood

Book Editors: Ola Erstad, Rosie Flewitt, Bettina Kümmerling-Meibauer, Íris Susana Pires Pereira

Chapter 2

Digital literacy practices in early childhood: theorisations

Ola Erstad & Julia Gillen

Abstract

There are many conceptualizations of digital literacies in early childhood that are theoretically rich and fruitful. However, the idea of a linear trajectory of historic developments is too simplistic. In the present day, we witness not a universally acknowledged sense of progress along a linear line of thinking, but rather a somewhat chaotic yet fruitful state of co-existence. We propose to explore some key points and tensions informing understandings of digital literacy practices in early childhood, by first introducing highly influential attitudes in defining literacy in early childhood leading up to the more diverse orientations during the last decade. Further, what we propose in this chapter is to structure the presentation around two loosely theoretical orientations; 'digital literacy as multimodal meaning making', and 'digital literacies as embodied, material and socio-spatial'. Towards the end of this chapter we draw out some implications and issues of theorisations within the field of digital literacy practices in early childhood.

Keywords: digital literacy practices, media, multimodality, technologies

Introduction

As this Handbook demonstrates, we are located in an extremely exciting time for developing understandings of digital literacy practices in early childhood. As other chapters in this volume make clear (Kumpulainen and Gillen; others to be inserted), the last few years have seen a rapid acceleration in empirical studies of young children's digital literacy practices in a variety of disciplines. We see this handbook as lying in a confluence of various disciplinary endeavours that for many contributors, and, we hope, readers, might usefully be distilled and united through such a term as New Literacies. Fine, we agree.

Or do we? Hold on! Do we mean New Literacies (Burnett et al. 2014; Lankshear & Knobel 2003), or do we mean New Literacy Studies (Gee 2015) or Literacy Studies (Barton 2007)? Or shall we drop the "Literacy" element in favour of a helpful step away from "literacy" with its connotations with alphabetic print, towards a term like multimodality, or broader conceptions of literacy in the new media age such as design (Kress 2003)? Also, attaching other concepts like 'digital' to literacy can be problematic since the aim of Literacy Studies has always been to look beyond a dichotomising focus. Literacy Studies scholars do not hive off decontextualized texts away from orality; for example Heath's (1983) key concept of "literacy event" brought both together in a focus on social action. Literacy Studies scholars tend to prefer to incorporate other sources of evidence beyond the text and indeed to bridge the online/offline divide (See Gillen, 2015 for a brief overview). And then, how dangerous to use the word "new": theories just as media move on and have a habit of ultimately discomfiting the theories they grew with (Marvin 1984; Lankshear & Knobel 2011).

So, can we start again? We want to explore ways of understanding a person, here a young child, engaged in digital literacy practices, let's say with a tablet, that while including screen

based activities, mediated by specific technologies, hardware and software, is still anchored in a physical environment and able to take action through interplays of cognitively-based decisions and embodied, physical actions. But this sort of account is in its own way reductive, or impoverished, as a century or more of scholarship has shown. If we conceive of a young child as an isolable individual, we are ignoring the social world she lives in and the historical, cultural and political processes that have shaped each and every factor of the activity that we have tried to outline or to begin a description with. We meant well – conceiving of the child first, with some level of agency, is surely a more humane and inclusive place than starting from a battery of tests and measures that decide whether what this child is doing is "literate" or not, and to what degree. Yet there are other ways of beginning to consider digital literacy and multimodality practices in early childhood, which argue that more ethical understandings can be reached if we value all entities in the picture.

So, what constitutes a theory of literacy? One approach in defining theories on literacy has been the historic account of how perspectives, on what literacy is, have shifted over time. These shifts are identified through key concepts as well as fundamental understanding of the interaction between children as readers and writers and the textual universe they relate to in different ways. Historicised accounts of literacy show how literacy, both in its material form and as theoretical construct, is deeply embedded in human development and the transformative nature due to technological progress (Street 1983; Graff 2010; Collins & Blot 2003; Olson 1994). We do want theorisations that will help us understand but also improve access, quality, learning and wellbeing in supporting young children's digital literacy and multimodal practices.

In this chapter, we propose that there are many conceptualizations of digital literacies in early childhood that are theoretically rich and fruitful. Nevertheless, there is no sense in which we can offer a synthesis and it is difficult to trace a chronological, linear trajectory. We could

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argue that from a nineteenth/early twentieth century conception of the young child as simply not yet literate, we came into the enlightened 1970s and 1980s to see the child as a meaning maker (Wells 1985). Of course, any such story ignores many predecessors, and it is possible to draw a trajectory from a focus on the child as individual towards an increasing focus on the social, and now, in the contemporary era, to a stretching out towards the all-encompassing ideals of post-humanism. However, this idea of a linear trajectory is too simplistic to describe the development of theories around the complexity of early childhood as they have actually combined at any one time. History has a habit of spiralling. Furthermore, in the present day we witness not a universally acknowledged sense of progress along this line of thinking, but rather a somewhat chaotic state of co-existence.

Since several compilations of theoretical positions, classical and more recent, already exist, see for example Mills (2015), we propose to explore some key points and tensions informing understandings of literacies in early childhood. We begin by introducing highly influential attitudes in defining literacy in early childhood leading up to the more diverse orientations during the last decade. Further, what we propose in this chapter and for the purpose of this Handbook is to structure the presentation around two loosely theoretical orientations that we put forward as rich and potentially at least fertile, as demonstrated in other chapters in this handbook, and then try to outline some of the developments and tensions behind these. These useful orientations are:

(1) Digital literacy practices always involve multimodality in two senses. First, we require and use theoretical dispositions that recognise that the child is always communicating using a variety of modes (Wolfe & Flewitt 2010). If we only acknowledge "reading" and "writing" we lose sight of the complexities of the child's meaning making in what can be literacy practices. Second, it is important to recognise that text is always and inescapably multimodal, whether on paper or screen.

(2) Digital literacy practices are embodied, material and can fruitfully be approached as socio-spatial and multisensory (Mills 2015). As soon as we think about space, we perceive that even what seems at first sight a classroom bound activity, for example, will have countless "lines of flight" (Deleuze & Guattari 1987) to other spaces. Such spaces are socially constituted within changing geographies. Digital literacy practices are complex interactions involving networks of technologies, human and non-human, elements of the environment and much else in dynamic entanglements. Any boundary between "digital" and "non-digital" is just one way of reifying a boundary that is in many ways artificial, that obscures their near-constant interpenetration (Burnett et al. 2012).

We now try to offer something useful in considering some of the productive tensions that have brought us to these positions. These theoretical positions are important underpinnings for the contemporary theoretical landscape. As we alluded to above, granting the child status as a multimodal meaning maker, as clear as that might have been to nineteenth century scientists and poets, as clear as it might be to almost everyone parenting or working with young children today, nonetheless represents massive shifts in scholarly views over the last hundred years or more.

The child as meaning maker – shifting positions

In the early 1900s, psychology developed as an academic field, with some interest in reading processes. Psychologists focussed upon measuring aspects of perceptual behaviour in individuals. They came up with the notion that children had to be "ready" physically and mentally, before they could learn to read. Interestingly, one leading researcher associated with this perspective that proved to be influential for 60 years, Huey (1908) argued that the

pedagogical implication of this was that early written language experiences could therefore be located within play. However, a "reading readiness" perspective (Morphett & Washburne 1931) won out, with serious consequences:

> First, an industry emerged concerned with promoting and selling reading readiness, usually with non-print-related activities and materials. Second, the limited definition of reading perpetuated a notion of learning to read as an associative activity, centred on perceptual identification and matching. Third, it supported an absolute distinction between being a reader and not being a reader. (Gillen & Hall 2012: 3).

Key understandings were built around developmental aspects of the child for language and literacy learning from an early age. Over time, and with reference to linguistics, this paradigm focused on language development and how it relates to reading and writing. As a theoretical position, it emphasises information processing abilities among individuals and individual differences. Of specific importance is early literacy learning for later literacy performance, and the provision of resources and environments to support early literacy learning. Specific for this paradigm is also the many tests that have been developed to map development of different literacy skills among children.

During the period from the 1960s until today, the cognitive theoretical position has defined literacy as a psycholinguistic process involving component sub-processes such as letter recognition, phonological encoding, decoding of grapheme strings, word recognition, lexical access, computation of sentence meaning, and so on, focusing on specific tasks in the interconnection between the child and the alphabetical text (August & Hakuta 1997). This also leads to theoretical conceptions of effective literacy instruction identifying crucial sub-

processes in reading such as phoneme-grapheme mapping, word-recognition strategies, identification of derivational morphological relations among words, as well as practice to achieve automatic processing of them. Reading and writing are seen as developmental processes towards what it takes to become skilled readers and writers, and several have defined these as specific developmental stages that all go through, with inspiration from Piaget and others (Chall 1983). This paradigm also showed how reading and writing must be seen as complex, multi-layered, and highly skilled processes involving a reflective and strategic meaning-orientated approach to behaviour.

A resounding blow was eventually dealt to reading readiness, even if its legacy continues in some aspects, with the perspective that came to be known as emergent literacy (Ferriero & Teberosky 1982). They pointed out that children, as active meaning-makers, will acquire cultural knowledge about print literacy before or without direct literacy instruction; an observation which carries at least as much weight in highly-technologised twenty-first century environments.

Another influential theoretical position brings together sociocultural theoretical understandings founded on conceptions of the child as integral participants in socio-historical developments. Cultural activities initially beyond the child's conscious understanding come to be appropriated by the child as part of their often self-driven learning. This theoretical paradigm grew partly out of a criticism of certain aspects of the cognitive paradigm and what was seen as limitations resulting from a focus upon theorising literacy as confined by the individual. Drawing on early theories by Vygotsky, the theoretical lens was drawn towards the social practices and cultural contexts where reading and writing was reconceived as constructions of particular social groups (Mills 2015: 17), and how individuals are inseparably connected to cultural history (Gillen & Hall 2012: 6). Sociocultural theorists'

ideas emphasising the use of diverse mediational tools and means to construct meaning (Wertsch 1998) led to understandings of social interactions underlying pedagogies.

The initiatives for these theoretical positions related to literacy came from researchers interested in the cultural contexts and diversities of literacy within different contexts in everyday life, not necessarily limited to schools and other overtly pedagogical institutions. Shirley Brice Heath (1983), for example, brought a commitment to longitudinal, naturalistic research from anthropology rather than psychology to the study of literacy in families. As Brian Street (1983), another key figure in the movement that became known as New Literacy Studies (NLS), Brice Heath brought ethnographic methods and sensibilities to the study of literacy practices in communities. Schooling could be understood as it was experienced by the child within the totality of their cultural experiences. Influential over the following four decades and more NLS or Literacy Studies (Barton 2007; Rowsell & Pahl 2015) continued to include linguists, historians, anthropologists, rhetoricians, cultural psychologists and educational researchers within the ranks of those determined to study literacy in naturalistic contexts. These influential studies all focused on the cultural contexts and diversities of literacy within different settings in everyday life, as an ecological perspective on literacy (Barton 2007). It was sociology and anthropology with their interests in cultural socialisation, the development of sociolinguistics with its interest in language as a social practice (Hymes 1974), and the growing interest in emergent literacy that led researchers in the 1970s and 1980s to look at literacy and homes in a different way (Gillen & Hall 2012: 6). As summed up by Mills (2015: 21): "These theorists emphasised the social, cultural and ideological construction of literacy practices that become taken for granted in daily communication, whether in homes, at school or social contexts."

The influential New London Group (1996) sought to rethink the purpose of literacy education within a broad agenda of social development, drawing on a diverse set of theoretical

influences such as critical theory (Gee 2000), social semiotics (Kress 2000) and on the implications of technological change (Luke 2000). This group of scholars set the ground for many of the diverse theoretical perspectives on literacy during the last two decades. One important contribution was the concept of 'multiliteracies' (Cope & Kalantzis 2000), which implied a much broader understanding of different forms of literacy in different settings. As an implication, the New London Group argued for studying diverse texts, media and practices to fully grasp children and young people's engagement with reading and writing. Another important aspect of the sociohistorical context at the turn of the twentieth century recognised by the New London Group, as well as others, was of course the development of digital technologies (Coiro et al. 2008) with emerging forms of literacy practice in both virtual and physical spaces and new ways of producing and sharing texts. The multiplicity of communications channels, media and modes, associated with the availability and convergence of new digital technologies, as pointed out in the term multiliteracies, makes this field in constant need of revisions of key concepts and theoretical perspectives.

Digital literacy as multimodal meaning making

A key theorist at the intersection between the socio-cultural paradigm and what is termed as a social-semiotic paradigm is Michael Halliday. His work 'Language as social semiotic: the social interpretation of language and meaning' (1978) defined how language and linguistics function together in relation to social purpose and context. Halliday has influenced many literacy theorists, especially within the paradigm termed 'multimodal literacies'. The most important theorists defining this paradigm have been Gunter Kress with his book 'Social semiotics'(1988), together with Richard Hodge, and later on van Leeuwen (Kress & van

Leeuwen 1996) . These scholars drew attention to different forms of modality as social forms of meaning making and how semiotics has evolved as a field over time.

Texts are multimodal

Multimodality has been defined as "…the use of several semiotic modes in the design of a semiotic product or event"(Kress & van Leeuwen 2001: 20). Most importantly social semiotics acknowledged the role of non-linguistic modes in human social meaning (Mills 2015: 65) As such it has also been pointed out that reading and writing have always been multimodal in combining words with spatial layout of the text, images, photos and other modes of representation. Multimodal literacy has then grown out of these perspectives showing how texts and literacy has changed in the 'new media age' (Kress 2003; Jewitt 2014). Young children interact with their environments, including people, through all the modes they have at their disposal, deploying sight, sound and touch. As has long been recognised, "Early childhood is intrinsically multimodal" (Lotherington 2017: 71).

Although multimodality Studies (e.g. Jewitt 2014) and the sociolinguistics of writing (Lillis 2013) demonstrate that any written text, as indeed any text, written or spoken, is intrinsically multimodal, it is undoubtedly the case that the increasing accessibility of complex combinations of modes deployed in digital technologies has led to a substantial focus on their qualities as multimodal artefacts. The ways children encounter texts as part of their everyday lives is also being ever increasingly complex and dynamic, no longer simply decoding, skimming and scanning, but moving across and among texts and modes. And rather than taking talk and writing as the starting point, a multimodal approach to literacy and learning starts from a theoretical position that treats all modes as equally significant for meaning and communication.(Jewitt & Kress 2003: 2).

The child, multimodality and text-making

The child is both conceived as a consumer of multimodal texts and a producer of such texts. And technological developments represent new possibilities for both practices, in what has been termed 'multimodal literacy'(Jewitt & Kress 2003). New media represent potentials for new ways of meaning making and sharing through many representational and communicative modes. The term 'mode' has been used to "refer to a regularised organised set of resources for meaning-making, including image, gaze, gesture, movement, music, speech and sound-effect" (ibid. p. 1). The New London Group, mentioned above, defined multimodal design as the most significant meaning making area since it concerns the interrelationship of different modes of meaning and the patterns of interconnection among modes (Mills 2015: 66). Concerning children, this dual conception of consuming and producing multimodal texts has been a central part of educational perspectives on literacy and learning. Children encounter storybook reading from an early age and at the same time engage with drawings and making visual representations. Children as active creators of meaning engage in processes known by a variety of terms such as resemiotization or transduction as they transfer content from one medium to another, inevitably transforming meanings as they do so

For several multimodal theorists and researchers, like Carey Jewitt (2014) and Rosie Flewitt (2012), it has been important to understand the implications of new technologies, both for 'reading' and 'writing', as ways of relating to content made by others and as ways of producing text oneself. Concerning digital literacy in early childhood it is the notion of the child as 'agentive self' (Hull & Katz 2006) and forms of agency that become interesting in the way children engage with multimodal texts in diverse ways. The interactivity of texts,

modes and agents of digital literacy has potential to reshape knowledge as curriculum (Jewitt 2008).

New directions for multimodal literacies

The interest in non-linguistic forms of meaning making has a long cultural history on signs and their meaning, but, as (Mills 2015 80-81) explains, there has, in recent years, been an important departure from structural and linguistic approaches within social semiotics and studies of multimodality. Hybrid forms of texts across a range of media and the scale of growing number of texts we relate to represent new conditions for the theoretical explorations of multimodality, becoming more complex. These developments also point towards theoretical explorations of integrating the multimodal paradigm with other theories about embodiment and space, which we will discuss below. Multimodal design has been used in the further development of the production mode mentioned above as ways of studying young children's text making at home (Pahl 2002), or as ways of engaging children in producing personal stories as part of digital storytelling (Hull & Nelson 2005). A continuing debate concerns the similarities and differences across structures of grammatical patterns in different modes, as well as similarities and differences of texts and textual practices across cultures, which also represent a link to socio-cultural theorists (Mills 2015: 83). Several attempts have been made to bring the paradigms of multimodality and socio-cultural theories closer together, such as (Street et al. 2014) and Jewitt (2011: 38) in order "… to fill out a larger more nuanced picture of social positioning and group practices, texts, contexts, space and time." This also provides a better alignment for studying new literacy practices among children of using Snapchat, touch screen devices or smartphone apps, as well as broader conceptions of everyday life and communicative competences in a digitally-mediated society.

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Digital literacies as embodied, material and socio-spatial

Even if Literacy Studies, and more broadly sociocultural perspectives, have long demonstrated that it is always rewarding to attend to the multiple activities through which people engage with texts in authentic interactions, this is particularly obvious in the case of young children who have not yet succumbed to schooled disciplines of imposed bodily regimes. Although they are becoming socialised into their society's conventions, their bodily movements and sensations are part of their interactions with any digital technology.

Many useful contemporary theorisations of young children's digital literacy practices share one element in common: a resistance to seeing young children's literacies and learning in strictly teleological terms. Too many pedagogic policies are based on essentially deficit-based frames – the child is defined in terms of what she cannot do yet, in terms of the learning goals that are externally set and that lie ahead.

From critical theory

For most people concerned with understanding digital literacy practices with young children, or indeed any other literacy-related activities in the world, the identification with critical approaches is an essential underpinning philosophy, as expressed within new literacy studies (Coiro et al. 2008). Literacy is always ideological since it is located within broader structures of cultural, economic and political power (Luke et al. 2003); Mills & Stornaiuolo 2018).

A common concern for theories under this paradigm within literacy studies is about social inequalities, social structures, power and human agency. Language and literacy practices are then seen as the product of relations of power and struggles for power. Many of the key

people in this area like Colin Lankshear, Hilary Janks, Peter McLaren and Henry Giroux revitalized theoretical perspectives from the Frankfurt school of social research and especially Paulo Freire's work on engaging children and youth in literacy work beyond the school and for creating consciousness on the social implications of literacy within the cultural context of poverty in north-eastern Brazil. As pointed out by Freire, schooled forms of reproduced knowledge and literacy could not transform life for those who are oppressed in society. One key text was Freire & Macedo's (1987) book 'Literacy: Reading the World and the World'.

Critical approaches to literacy address the ideologies of texts and practices and how literacy in schools and kindergartens is defined as from a specific perspective and for certain interests by ways of domination and marginalisation. Literacy events in schools then, are rule-governed social contexts that have embedded values, identities and symbols of the social world (Mills 2015: 42). An aim is to deconstruct dominant traditions in schools and society by providing other perspectives and ways of using a variety of textual opportunities in people's everyday life that they themselves can find relevant and authentic in order to liberate and transform action and knowledge. Many scholars and educators such as Vivian Vasquez (2014) have pursued these ideas in the context of early childhood education and demonstrated how a critical literacy curriculum can be created out of the problems and everyday life dilemmas that can emerge spontaneously in classrooms. Janks' framework for critical literacy education (succinctly summarised in Janks [2013]) explains how the dimensions of power, diversity, access and design/redesign must be considered as interdependent; critical approaches to literacy curricula, pedagogic approaches, resources, etc., must consider them together. Mackey & Shane (2013:14) argue that the development of critical understandings of contemporary media aimed at children "must take place in the context of very sophisticated aesthetic, ideological, and commercial manipulation of multimodal options for young

people." They offer a framework of analytical perspectives, perceptual, ideological and structural, drawing on the work of Frank Serafini, to think through children's ever shifting landscapes of media and modalities.

Literacy is seen as a constant social struggle also concerning early childhood literacy. Critical theory reminds us that we need a critical distance in our understanding of the transformations represented by digital technologies on children and families, partly on the wider cultural implications of using digital media and the material as well as the socio-spatial conditions created for agency through using digital media. Henry Giroux, for example, has written about the impact of cultural industries like Disney with more pessimistic undertones about childhoods in contemporary societies, not only in the US, but worldwide (Giroux & Pollock 2010). In this sense literacy is not a neutral term, but a perspective on specific social practices that always implies tensions and unequal positions, as between children and adults or between ways of understanding technologies in early childhood.

We would argue it is vital that the contemporary panoply of approaches to young children's digital literacy practices retain confidence in challenging narrow, reductive frameworks that define learning goals in strict terms of the acquisition of skills. It is vital to recognise that young children are essentially creative and that play is a vital component of a young child's wellbeing.

Towards material, socio-spatial and post-humanist approaches

More recent theoretical positions represent a rejection of the focus on measurable assessment of narrowly conceived skills of the individual child in an environment that will be inauthentic to many children, especially those whose everyday lives do not readily and comfortably map onto the environment of the testing regime. This rejection, as we have discussed, stems from

a recognition that this accountability regime, of standardised testing, does violence to the life experiences, talents and indeed skills of children from backgrounds that do not comfortably align to what is required of them in such demands, as for example expressed in the 'funds of knowledge' approach (González et al. 2005). Therefore, socio-spatial, socio-material, and other allied approaches seek to work from a stance grounded in social justice, to offer richer cultural educational contexts in which young children may excel.

The cluster of approaches presented in this section represent a turn towards more attention to the socio-material aspects of all living and learning, in which it is not always most fruitful to conceptualise of agency for example as necessarily residing in individuals and not in technologies. See for example the review by Burnett, (2010) which draws on actor-network theory. Such lenses might be seen as a development onwards from the sociocultural perspective on early childhood learning that has been so fruitful. There has followed a a dissatisfaction and rethinking of some key sociocultural terms. For example the notion of "tools" in classic Vygotskyan theory encompassed everything from a stick to a symbolic system such as language (Vygotsky 1988). A child might be sitting on a chair, using a tablet, playing on a virtual world in which others are present, and then write a message on sign visible there. Where does the environment start and end? Are the chair, tablet, virtual world, virtual sign that can be written on all tools? But before we tackle the multi-layered and always material nature of the so-called virtual, let us take a step back as it were to some key principles of what we might call a new attention to aspects of materiality. (We avoid the contested, apparently singular nature of "the material turn" as useful as that might be in certain disciplinary approaches).

Kuby & Rowsell (2017: 288) introduce a special issue of the Journal of Early Childhood Literacy on "Early literacy and the posthuman: pedagogies and methodologies" explaining,

Posthumanism is rooted in a relational ontology, meaning we (humans,

non-humans and more-than-humans) are all always already entangled with

each other in becoming, in making, in creating realities (the world). It is

about the now, not solely about a future to come. It is about the in-the-

moment realities of literacy learnings that happen today….

Among many other implications, this can be seen as a productive revaluing of the importance

of play, as place-making entanglements that can be used to call into question established race

and class-based assumptions about literacies (Johnson Thiel & Jones 2017).

Socio-spatial and socio-material approaches to literacies seek to place at the forefront of our

attention the fact that all literacy related activities take place in spaces and that these spaces

are socially experienced and produced. (Comber 2016: 59) argues that using this insight as

an underpinning theorisation can allow for the creation of a "focus for learning and a frame

for curriculum design [that] is both generative and productive." What has been termed 'the

spatial turn' (Mills & Comber 2015) and 'spatializing literacy research and practice'(Leander

& Sheehy 2004) represents a deeper understanding of contextual processes of meaning

making and how boundaries (Phelan et al. 1993) and (dis-)continuities (Bronkhurst &

Akkerman 2016) constitute certain practices. Spaces and places are seen as inter-relational

and something people and artefacts move between, as material artefacts and resources that

cross between homes and communities.

These theoretical explorations also draw on cultural geographies and geosemiotics (Leander

& Rowe 2006; Leander et al. 2010) studying how the childhood experience of and in space

has changed dramatically between generations. (ibid., p. 349) One example is the shift from

spending leisure time outdoors to indoor play, and how changes in infrastructure of cities and

communities also transform the learning environments of children and their families, what

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has been termed 'new mobilities' (Mills 2015: 94; Leander et al. 2010). Materiality also becomes evident as part of literacy practices, as well as the cultural sensitivity of childhood spaces for learning and literacy as diverse. And if socio-spatial understandings emerge from investigations in children's own environments then those children are positioned as experts rather than positioned as deficient from the beginning.

The most important change of spatial literacies in recent years is of course the introduction of digital technologies and online spaces in the everyday lives of children (Merchant et al. 2012; Thomson et al. 2018). Virtual literacies open up new interactive spaces for participation that has triggered theoretical considerations of new practices for reading and writing. The importance of the interrelationship between online and offline spaces has increased as the multi-functionality of mobile devices has become increasingly accessible, also providing access to new platforms of participation like 'Minecraft' (Bailey 2016).

Another recent theoretical perspective is described as 'sensory literacies' (Mills 2015: 137). This is especially relevant for digital literacy in early childhood since touch screen technologies has become a key artefact in the way children interact with digital technologies. The emphasis is on the sensorial and embodied nature of human experience, perception, knowing and practising, and which draws from anthropology, sociology and philosophy of the senses. (ibid.) The history of literacy has been dominated by words and the visual, while new technologies provide opportunities to use a variety of different human senses. In several projects 'touch' has been targeted as a more dominant sense that the visual, for example Carey Jewitt's 'IN-TOUCH' project on digital touch communication, also as a further development of multimodal approaches.

Both the socio-spatial and sensory approaches to literacy are rather new and are still in development, even though they obviously draw on former theoretical paradigms like socio-cultural and multimodal approaches.

Across the field of digital literacies for early childhood

Looking towards contemporary and future orientations of theories on literacy it is clear that the issue of literacies itself is becoming increasingly complex and diverse. We discern a growing desire to take much more account of the environment, understood as physical, cultural, economic and so on, in the multiple networked ways in which agency is distributed, than in more traditional accounts.

One implication across different theoretical stances to digital literacies in early childhood education is recognising that the phenomena we study, and are part of, are reactive in ways that may be responsive, agentive, resistant to, or shaped by relations of power that are simultaneously visible in the momentary and local, and yet potentially analysable at the largest scales of economic and political relations.

A second implication of different theoretical stances to digital literacies is in understanding that the researcher does not merely collect data but rather generates data (Thomson & Hall 2017; Dyson 2016), as she participates in the research. The researcher is required to reflect on their own positionality, and the importance of actively recruiting diverse ways to elicit others' points of view.

A third implication of different theoretical stances to digital literacies and multimodality in early childhood involves paying constant attention to methodology. There is a greater focus on multimodality in the methodologies that researchers into early childhood practices with digital technologies deploy. Again, it could be argued that this is not in itself new; creative

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uses of photography and then video have a long and honourable history in early childhood research (Barker & Wright 1951; McDermott 1976). Developments in methodologies are significant instantiations of theory and praxis that also require responsible attitudes in deployment and dissemination (Kuntz 2015).

As suggested earlier in this chapter there are several theoretical tensions about digital literacy in early childhood that are apparent in this field of research. One key site of contention is between measurable assessment and creative play practices among children using digital technologies. Both represent specific ideologies of childhood, literacy and learning putting the child at the centre. Narrowing down what is researchable to specific categories of measurement limits our understanding of digital literacy practices, while emphasising creative play might romanticise the agency of children. Rather, the developments of digital technologies today open up much more complex and connected understandings of what literacy practices represent for children and their environments. For example, multimodal approaches acknowledge that the sites of display are being transformed by the design of new and ubiquitous technologies, learning spaces and cultural spaces (Mills 2015: 88). We also see that terms like 'multiliteracies' are being repositioned to address contemporary challenges (Guo et al. 2009 see also the new national curriculum of Finland of 2017). However, some also warn that we might risk a 'pedagocization of everyday life'(Sefton-Green 2016) in the way we theorise about the implications and possibilities of digital literacy practices in early childhood. In concluding we will therefore use some insightful words from David Olson;

It would be simple minded indeed to believe that any small number of factors could explain major social or psychological transformations such as those associated with literacy. But if we think of a theory as a machine to think with, a device for organizing and interpreting events with the aim of bringing other questions and other forms of evidence into conjunction,

then it is not at all unreasonable to aspire to a theory of how writing contributes not only to our understanding of the world but also of ourselves (Olson 1994: xvii).

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