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Young children's digital literacy practices in homes: Past, present and future research directions

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Abstract

This chapter summarises research knowledge on young children's digital literacy practices in homes and proposes future directions. We build upon findings from our earlier review of research published 2005-15 (Kumpulainen & Gillen, 2017), exploring research published 2016-17. Our analyses are informed by Green's (1988) 3D model of literacy. Three themes are identified: *parental mediation of children's digital literacy practices in homes*; *children's media engagement and literacy learning in homes*; and *Home-school knowledge exchange of children's digital literacy practices*. We offer key messages for those interested in established and emerging areas in this dynamic research field.
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5 keywords

young children; home; parents; digital literacy practices; media

Introduction

The changing nature of childhood in the digital age is currently attracting major attention among researchers, educators, health care professionals, parents, and policy-makers (Livingstone et al., 2017). Public media is also increasingly occupied by various and, at times, less harmonious discourses about the opportunities and risks of the digitalized society for children's healthy development, learning and wellbeing. Often, the focus is strongly or solely directed towards the potential harm of exposure to aggressive, sexual and commercial media content, while at the same time children's rights to provision, protection and participation in the digital age are inadequately addressed (Livingstone, 2016). The need to summarise existing research is therefore vital to consolidate existing knowledge of contemporary childhood and what the prevalence of digital technologies may entail for children's everyday life, learning and wellbeing as well as for parenting and education. We also need a sufficient evidence base to guide policy and practice in the field.

Our chapter responds to the urgency in today's rapidly changing world to conduct and in turn review research that has investigated children's digital literacy practices in homes. We approach the notion of children's digital literacy practices broadly, and define it to include all research studies that deal with young children's (aged between 0-8 years) engagement with digital technologies and media in homes.

The work we report in this chapter builds on our previously published open access literature review (Kumpulainen & Gillen, 2017) hosted on the DigiLitEY website (http://digilitey.eu). In that review, we analysed 33 articles and reports published between 2005 and 2015 in order to summarise current research knowledge in the area of young children's digital literacy practices in homes. In this present chapter we will discuss the key findings of our earlier research in the context of our most recent review to illuminate how the research field is developing.

In sum, the work reported in this chapter has two aims. First, we aim to summarise how research published in 2016 and 2017 has added to the findings of our earlier review of literature. Second, in order to develop a conceptual picture of the latest studies in the field in terms of how these have addressed and approached young children's digital literacy practices in homes, we have applied Green's (1988) 3D model, focusing on three interrelated dimensions of literacy, namely the operational, cultural and critical (Green, 1988: 160). Via this conceptual analysis, we hope to identify recent research trends in the area, identify gaps in current research foci, and propose key research directions for future study.

Review methods

Search procedure

For this chapter we carried out several searches of databases to identify as many as possible salient journal papers and online reports dealing with the young children's (aged 0-8 years old) digital literacy practices in homes within the time span of 2016 and 2017. The research area of young children's digital literacy practices in homes has attracted attention among researchers working in various fields; a feature of this literature review is that it draws from several disciplines. We adjusted our queries, worked with various databases and set up database alerts. Reading abstracts led us to exclude some articles initially identified as irrelevant. In line with our earlier review we did not include books or book chapters; therefore it is likely that our search has omitted some findings that ideally should have been included.

We included research studies that were published in peer-reviewed journals and online reports, and written in English. The most productive single search query was of the Web of Science, "(TS=(("young child*" AND media) AND (home* OR family)))". An important point to recognise is that research studies involving children's digital literacy practices in homes sometimes prefer to locate themselves as concerning "media" rather than "literacy". Hence, to search for studies that self-identify as "literacy" studies would be too limiting and lead to an exclusion of relevant research interested in, for example, parental influence on children's media use, skills and learning.

Nevertheless, it is striking that our earlier search for research published between 2005 and 2015, likely to be incomplete for similar reasons, nevertheless yielded 33 texts for our analysis. The searches carried out for this chapter, dealing just with publications of 2016 and 2017 (available by end November 2017) identified 42 articles and reports. Even if our search strategies are incomplete, this suggests a rapid increase in research attention over the last few years.

Analysis procedure

Our analysis procedure of the selected 42 articles is informed by a descriptive and narrative approach (Dixon-Woods et al.., 2006; Kavanagh et al., 2012) that strives for a comprehensive synthesis of different research designs and methodologies. Our analysis of the literature was guided by an understanding of three areas of significance in relation to researching young children's digital literacy practices in homes as identified by our earlier work (Kumpulainen & Gillen, 2017): Parental mediation of children's digital literacy practices in homes; Children's media engagement and literacy learning in homes; and Home-school knowledge exchange of children's digital literacy practices. (Note that we use the word "parent" to stand for children's principle carers whoever these may be.)

Next, in order to develop a conceptual picture of the reviewed studies in terms how they addressed literacy practices, we also found it useful to apply Green's (1988) 3D model of literacy. Green's model holds that there are three "significantly interrelated dimensions" of literacy, namely the operational, cultural and critical (Green, 1988: 160). In our work, we extend Green's original formulation into the digital domain and suggest that in addition to more traditional literacy that focuses on the written language system and how it is handled, in our work operational elements also include those skills needed to decode and encode digital texts and artifacts, in addition to being able to use digital software and hardware for reading, writing and communicating. The cultural dimension of literacy entails competency with regards to meaning-making systems. It includes understanding literacy, also digital literacy, as a cultural practice and being able to read the cultural signs embodied in acts of meaning-making. Learning hence involves being socialised into a culture. The third element of the model, the critical, emphasises the need for critical engagement with literacies, including digital texts and artefacts of all kinds, the need to ask questions about power, about intended

audience and about reception. The critical dimension is to do with the human capacity for active agency, and transformation and production of culture, rather than being understood as young children merely engaging in practices of socialization into existing surrounding cultural practices. In this respect the critical dimension also entails creativity.

Taken together these three dimensions - operational, cultural and critical - are complementary to our understanding of literacy as "the increasingly proficient way in which children develop inner control over the complexity of meaning-making systems" (Wolfe & Flewitt, 2010: 397), also emphasising the nature of that complexity including relations involving power. Thus, we hold that considerations across all three dimensions are required if children are to navigate successfully in the twenty-first century's digital climate.

Results

We will now turn to the results of our review. We will begin by considering how our current review compares to our earlier findings on young children's digital literacy practices in homes. Then, we will turn to the key findings of our conceptual analysis based on the 3D model of literacy, focusing on how recent studies in the field situate themselves in terms of understanding children's digital literacy practices in homes.

A. Parental mediation of children's digital literacy practices in homes

About half the studies reviewed by Kumpulainen and Gillen (2017) focused on parental mediation of children's digital literacy practices in homes, although in some research studies this theme intersected with a research interest in children's media engagement and literacy learning. We now quote key findings, noting the relationship with the newer studies. Findings from Kumpulainen & Gillen (2017) are numbered and italicised, followed by findings from the more recent research.

A1 *Many parents see digital technologies and media as positive but challenging at the same time.*

Research evidence continues to suggest that the use of digital technologies is viewed by parents with ambivalence. O'Connor & Fotakopoulou (2016) refer to this tension as a "divisive issue" (pp. 246). Likewise, in their article, Brito et al. (2017) who considered 14 national reports stemming from projects on young children and digital technologies, identified great diversity in parents' perceptions, even sometimes within the same families. The advantages of their child's media use among the UK parents of 0-3 year-olds were found to include the learning of new skills; keeping children occupied, exposing them to new knowledge, entertainment sources and the opportunities to be creative. However, a quarter of the parents were concerned that their children could become dependent (Brito et al., 2017).

A case study by Yılmaz Genç and Fidan (2017) dealing with five families in Turkey found out that parents considered tablet use as educational and also valued their children's use of games. However, they expressed concerns that unless their young children's interactions were properly regulated, use of digital technologies and media could lead to anti-social behaviour and exposure to inappropriate content. Similarly, Teichert (2017) reports tensions mothers in Canada felt with regards to allowing their children's digital practices at home; all "expressed concerns that their children engaged in too much screen-time" while still "feeling there were positive learning experiences tied to digital tool use" (Teichert 2017: 73). The study points out how adults' beliefs about the appropriateness of digital media for their children influence these children's exposure to and interactions with digital tools.

A2 *Parents are not always aware of the range of children's online activities and their skills*

According to our recent search results, it appears that research focusing on parents' awareness of their young children's online practices and related digital skills has not been greatly explored in the latest research. This may partially result from the fact that researching this topic demands a sophisticated methodology, including a multi-layered approach to data collection. In a US study, Vittrup et al. (2016) found out that only a minority of parents "could accurately identify their children's proficiency with various technologies" (pp. 48). Altogether, these findings from our review point out that research focusing on the operational dimension of children's literacy learning with digital technologies and media is scant.

A3 Benefits of children's digital activities are less straightforward to parents than seeing the risks.

Our current review reveals that although not exactly specified, parents tend to identify more opportunities in children's digital activities than documented earlier. Yet, also concerns over risks are still present. For instance, Palaiologou (2016) conducted a mixed methods study in four European countries. She selected England and Luxembourg, which have relatively higher users of digital technologies, and Malta and Greece where there are lower levels of use. She found out that "in all four countries parents did not believe that their children were at risk with using technologies" and that they were convinced of the benefits of appropriate use (Palaiologou, 2016: 15). In the US the majority of parents studied by Vittrup et al. (2016) disagreed with the early recommendations from the American Academy of Pediatrics Committee on Public Education, AAP (2001) that states that children under 2 years old should have no screen time. Their study showed that, in general, "these parents had very positive attitudes towards media and technology and believed it to be an important part of their children's lives now and in the future" (Vittrup et al. 2016: 52). The AAP now acknowledges that the 2001 recommendation was prior to touch screen and internet enabled toys so now they advise no more than two hours per day for under 2 years of age and declare that content matters: "The quality of content is more important than the platform or time spent with media. Prioritize how your child spends his [sic] time rather than just setting a timer" (Brown et al. 2015: 1). An in-depth study of 10 families in the Czech Republic with a child aged 7 to 8 revealed that parents hold a complex matrix of understandings of opportunities associated with use of digital technologies and media. Their perceptions of risks were more oriented to the unknown future than applicable to the present (Smahelova et al., 2017).

At the same time, some studies have identified a greater concern of parents of young children over disadvantages and risks of interacting with new technologies than confidence in benefits. For example an ethnographic study of parents of 2-6 year-olds in South Korea uncovered the guilt that parents commonly felt over what they considered to be their own failures in managing their children's media use (Seo & Lee, 2017). The parents' negative perceptions included fears of psychological problems, physical effects and adverse influences on cognitive development. Likewise, Croatian parents of 3-7 year-olds studied by Miklelić

Preradović et al. (2016) who had digital technologies in their homes, agreed that these could have educational benefits but were "anxious" and not always willing to allow their children to use them. Fewer than half of the parents in this study allowed the child to use a pc, tablet or smartphone.

In a survey study of a highly technologized environment situated in Singapore, Ebbeck et al. (2016) reported that parents of young children were most concerned about vision deterioration and addiction in screen use. Top benefits identified were the capturing of children's interest and the development of motor skills. As a conclusion, Ebbeck et al. (2016) caution: "It is important for parents to realise that a technological device is not a toy, but an adult's tool" (Ebbeck et al., 2016: 32). They recommend that children below the age of 2 should not engage with screens and that parents should be careful of the commercial motives of educational apps.

A4 *Parental mediation includes "co-use", "active mediation", "restrictive mediation", "supervision", "technical safety" and "guidance".*

Parental mediation styles in relation to young children's digital literacy practices in homes continue to attract researchers' attention. As Lim (2016) argues, "The advent of pervasive, ubiquitous media has engendered the practice of 'transcendent parenting' which goes beyond traditional, physical concepts of parenting, to incorporate virtual and online parenting and how these all intersect" (pp. 21). Similarly, Zaman et al. (2016) discussing a qualitative, mixed-method study involving 24 Flemish parents and 36 children aged 3 to 9 in Belgium point to the emergence of new manifestations of parental mediation with regard to children's digital practices and provide evidence of their dynamic, often paradoxical nature. According to their study, insights on distant mediation, various buddy styles, and participatory learning, as well as the value of a wholeness approach for understanding children's conditions for media engagement, suggest new prospects for parental mediation literature. Altogether, based on our review, and as agreed by the review conducted by Coyne et al. (2017) the nature of parental rules and restrictions for their children's digital literacy practices, parental motivations for allowing their children's media use as well as overall parental mediation patterns are currently among the key research foci in the reviewed studies. The review by Neumann & Neumann (2017) more specifically on tablet apps emphasises the possibilities of parental support of emergent literacy development.

According to most recent research evidence, parents typically set rules for their children's digital literacy practices in homes. For instance, Palaiologou (2016) reports that 86% of the parents in the four European countries she studied applied rules to their young children's use of digital technologies. The detailed study of a small number of families in the Czech Republic by Smahelova et al. (2017) also identified great complexity in parents' mediation strategies in relation to space and time management. In their study, dealing with ethnographic interviews with 20 South Korean parents of 2-6 year-olds and observations of 10 children during their media use and interaction with parents, Seo and Lee (2017) report that parents presumed that touchscreen media wielded a more negative than positive influence on their children. As a result, parents were found to engage in restrictive and technical mediation, though they often failed to effectively manage their children's media use due to practical challenges. The failure of parental mediation made the parents feel guilty. As a result, the researchers propose a greater need to attend to the contexts and emotions in which parental mediation of children's media use occurs.

Current research has also directed its attention to the ways in which parental mediation interacts with children's digital literacy practices, behaviour in general and health. Samaha and Hawi (2017) approached their study of parents in Lebanon (of children aged between 6 and 11) with an assumption derived from earlier research that for children to spend more than two hours a day with digital technologies can be harmful. They reported that "Children whose parents reward good achievement/behavior by allowing screen time, punish bad achievement/behavior by prohibiting screen time, and allow screen time to keep them quiet are more likely to exceed the daily screen time recommendation of a maximum two hours" (Samaha & Hawi, 2017: 351). Thus, there was a positive association between higher use of digital technologies and parental strategies to regulate this use. Working with the same starting point, that over two hours a day is "excessive electronic media use", Séguin and Klimek (2016) reported from their questionnaire study of parents in Eastern Canada that "there were strong significant positive correlations between the amount of television (TV) watched and hostile-aggressive, anxious-fearful and hyperactive-distractible behaviours and significant negative correlations between amount of sleep and computer use, video game console use and TV viewing" (pp. 981). McDaniel and Coyne (2016) conceptualise and investigate "technology interference" in their study of how technology-mediated interruptions

can disrupt co-parenting interactions and in some cases can be linked to depressive symptoms.

In their survey, Bentley et al. (2016) identified a variety of motives as to why parents allow their children to interact with screens including relaxation; rest; distraction; reward for good behaviour; valued educational opportunities and the development of skills. Vittrup et al. (2016) found that 90% of parents of young children in their sample used digital technologies to distract their children. Interestingly, in a study of low-income parents of Mexican-American pre-schoolers, Thompson and Tschann (2016) reported that "Only 49% of participants had ever thought about the impact of background TV" and that "Believing that background TV is not harmful was associated with higher levels of background TV exposure" (pp. 1835). In a Spanish study, Matsumoto et al. (2016) found out that tablets and televisions were used by children relatively autonomously, albeit with some boundary setting, whereas the use of laptops and smartphones were more closely supervised.

It can be concluded from current research that conceptualising the nature of parental mediation has undergone some thoughtful reconsideration in recent years. For example, Troseth et al. (2016) discuss how the concept of "co-viewing", useful in discussions of children and parents watching television together, needs modification in consideration of touch-screen technologies which have various kinds of contingency built into the medium. They conceptualise adult scaffolding as directing attention, providing cognitive support and social feedback. Similarly, van Kruistum and van Steensel (2017) distinguish between three mediation styles: regulation, guidance and space, and discuss various types of values applied to parents' decisions about mediation and regulation. Brito et al. (2017) characterised four parental mediation styles as authoritative, permissive, laissez-faire and authoritarian. These are listed in the order of commonality overall in their pan-European study, but the authors identify some countries as strong in each tendency relative to others. They also demonstrate how mediation styles can evolve over time.

A few researchers have also pointed out the need to support parents in interacting with their children for supporting their children's literacy development. For instance, Radesky and Christakis (2016) reported that some researchers have suggested that parental interactions with children and ebooks are impoverished as parents may focus on mechanical instructions;

they contributed to advice that "Parents should….be instructed to interact with children during eBook reading, as they would a print book" (Radesky, Christakis, & Council on Communications and Media, 2016: 2).

A5 Parental mediation is linked with the number and nature of media devices in the home, and the parents' gender, education, cultural/socioeconomic background, computer/internet skills and attitudes.

Our current review of literature suggests that demographic correlations with children's technology use are weakening in some areas. For example, in the USA a high level of activities with digital technologies is permeating across families as "the American society has become so media and technology saturated in general…" (Vittrup et al., 2016:50), a finding also supported by Radesky and Christakis (2016).

Correlations in parents' socio-economic and/or cultural background and the nature of their children's digital literacy practices exist in quite limited aspects. For example, in an extensive US study, McClure et al. (2017) reported associations of children's app ownership and household income, with those on lower incomes having fewer. However, all families regardless of their demographics agreed as to the educational value of apps. Middle and higher income families tended to rely more on recommendations from people they knew, whereas those on lower incomes were more likely to use search boxes, app descriptions and reviews to find out more about educationally valued content for their children. In a Finnish study Määttä et al. (2017) found correlations between sedentary behaviours and parental SES. They suggested that sedentary behaviours were higher among lower SES and that reading time at home was greater if mothers had a higher level education. However, this research was based on two perhaps questionable assumptions: that use of screens implies sedentary behaviours and that reading does not occur on screen-based technologies.

Broekman et al. (2016) studied parents' mediation of app selection for children aged 3 to 7 and reported that parents valued the capacity of apps to supply independent entertainment. They propose a possible extension of demographic and other variations to investigate the arena of parenting styles. In a survey study of mothers of children aged between 1 and 4, Pempek and McDaniel (2016) reported that where families owned a tablet "child's frequency

of use was positively associated with child's age and mother's use, and negatively associated with mother's relational wellbeing" (pp. 2636). Within this strand of research, Beyens and Eggermont (2017) found a relationship between mothers' working hours and children's television watching time.

A study by McDaniel and Coyne (2016) focusing on technology interference in the parenting of young children reported that many mothers perceived that technology interrupted co-parenting interactions, especially during unstructured parenting such as playtime. The study advises parents to critically examine and potentially regulate technology use during family interactions.

B Children's media engagement and literacy learning

In our earlier review, (Kumpulainen & Gillen, 2017) slightly fewer than half the studies focussed on issues dealing with children's media engagement and/or literacy learning. Again, we present key findings together with explorations of how more recently published literature relates to these findings.

B1 *Children in Europe grow up in media-rich homes*

It has now become relatively commonplace to use labels, such as, "the touchscreen generation" (Kostyrka-Allchorne, Cooper, & Simpson, 2017: 654) and indeed those researchers found "emerging evidence of concurrent multi-screen use among very young children" (Kostyrka-Allchorne, Cooper, & Simpson, 2017: 654). Similarly, Palaiologou (2016) found that all families studied had access to television sets, computers and the internet and that all children were engaged in related activities. In the US too, use of digital technologies appears to be increasing year on year as the overwhelming majority of children aged under 2 have access to mobile devices (Radesky & Christakis, 2016). Ninety-eight per cent of children in the US have at least one mobile device in the home as well as a TV (Rideout, 2017).

In their overview Sefton-Green et al. (2016) make the important point that whereas some families in Europe have access to multiple devices and unlimited broadband, for others access to technologies may depend on a shared smartphone with limited connectivity. However, by

the age of two most children are using a tablet or laptop, using them to access TV programmes and video clips, or to play games and use apps (Sefton-Green et al., 2016).

B2 *Digital technologies and media are an important (but not dominant) part of children's lives.*

Research evidence on the dominance of digital technologies and media in children's lives has become somewhat more mixed compared to the findings of our earlier review of research (Kumpulainen & Gillen, 2017). Palaiologou's (2016) study in four European countries identified that technologies did not dominate children's lives but were an important part of children's everyday lives, confirming many earlier studies (Kumpulainen & Gillen 2017). However, a US study offers evidence to suggest that digital technologies may take a dominant place in family life, finding that parents spent 7 hours of their time per day (outside work and sleep) and their young children almost five hours a day (Vittrup et al., 2016). A survey study of 33 families of 3-5 preschoolers in a town in the Midwest categorized their play as technology; non-technology and outside (Slutsky & DeShetler 2017). It was found that technology lay between the other two categories in terms of time spent. Also, in a study in Spain, digital devices were perceived by parents as "in competition against traditional forms of play and outdoor and physical activity" (Matsumoto et al., 2016: 5). In addition, Rideout's (2017) study in the US found that children from lower-income and/or lower educated families spent most screen time, particularly because TV watching has declined in higher-income families. In a study of Australian 3-5 year-olds in their homes, Given et al. (2016) explored the multiple, complex ways in which children "used information technologies in their homes to orient themselves in daily life and to solve problems" (pp. 344).

B3 *Children typically demonstrate agency over technology: Digital activities interact and support children's "offline" life interests as children use digital media as an enlargement of their activities.*

Research evidence continues to demonstrate that digital technologies and media can support and enlarge children's everyday activities. In her study, Palaiologou (2016) reported that digital activities were integrated into children's interactions with parents and personal explorations. Similarly, Given et al. (2016) found evidence in an observational study that

young children can combine digital technologies with their social and dramatic play and their offline literacy and numeracy learning in the home.

On the other hand, our review of the latest literature reveals that overall there are very few studies that have focused their attention on children's agency or creative use of digital technologies and media in homes. This is a serious gap as also implicitly pointed by Aliagas & Margallo (2017) who argue that Reader Response models used to understand children's reading responses with storybooks need to be revised as interactive elements offered by digitalization increase the child's autonomy, positioning a child "as a collaborator, storyteller, an author or an internal character in the fiction" (p. 44).

Marsh (2016) advocates for further research complexifying understandings of young children's digital literacy practices in homes. In her study, she shows how repeated viewings at home of 'unboxing' videos on YouTube co-constructed a 4-year-old child as "a cyberflâneur through dialogic practices that included … movements and sounds" (Marsh, 2016: 377), facilitating global and instantaneous peer-to-peer creation and sharing of multimodal texts with a range of textual pleasures.

B4 *Children's literacy learning with and from digital technologies and media is mediated by the social context. Children learn from parental and peer mediation as well as from observation and imitation; parents seem sometimes not to be aware of their children's mirroring their behaviour.*

Our present review reveals that little research attention has been directed to children's literacy learning with and from digital technologies and media in homes. This same finding was also suggested by our earlier review in the research field. A study by Akhter (2016) of interactions involving a 7-year-old and his grandmother searching for Qu'anic resources on the internet, demonstrates that knowledge can flow both ways. The grandmother contributes religious knowledge and understanding of the Arabic script and the child ICT skills, English and understanding of digital search strategies. Learning and socialisation in the social context created by the use of digital technologies and media can hence be bidirectional, as also argued by Smahelova et al. (2017). Similarly, another case study by Marsh et al. (2017) found that children's digital literacy practices in homes "involved extensive engagement with

other family members who scaffolded their learning and were delighted in the children's technological capabilities." (Marsh et al., 2017: 47).

Current research also points out that although young children may be described as having learnt to use technologies on their own, this learning actually includes a lot of observations and close interactions with others (Matsumoto et al., 2016). A survey study in the Netherlands by Nikken (2017) confirms these findings and reports that children mirrored the amount of parents' use of digital technologies in relative terms.

B5 *Using devices that are not configured for children's use increases their risks of problematic experiences with pop ups sometimes with inappropriate content and in-app purchases.*

In our latest review, we did not find studies investigating children's use of inappropriate content, whether accidentally encountered or otherwise. However Vittrup et al. (2016) suggest that children's increased unmonitored use of digital technologies, combined with over-estimation of children's knowledge, has the potential to lead to such vulnerabilities. This is a concern also shared by Elias and Sulkin (2017) studying toddlers' use of YouTube in Israel, as well as by Smahelova et al. (2017) investigating 7-8 year-olds in the Czech Republic. In their review of tablet use, Neumann & Neumann (2017) call for higher quality emergent literacy apps.

C Home-school knowledge exchange on children's digital literacy practices

Since our earlier search (Kumpulainen & Gillen, 2017) as well as our more recent searches have focussed on studies of young children at home, it is particularly likely that we have not identified all research findings dealing with home-school knowledge exchange on children's digital literacy practices. Nonetheless it was striking that certain key arguments were made consistently across a few papers reviewed by Kumpulainen and Gillen (2017). These key arguments are now taken together and revisited in the light of later literature.

C1 *Children and parents believe that educators have little knowledge of children's media engagement and digital literacy at home*

C2 *Children report limited school work related to digital literacies*

C3 Parents would welcome stronger and more collaborative relationships with ECE/school settings, with information-sharing and exchange of good practice

This key message of Kumpulainen and Gillen (2017) was strongly supported by Palaiologou's (2016) findings in four European countries. Since digital technologies are a significant element of children's everyday home lives, parents typically want more integration with their learning in schools, and more attention and support from educators. The UK parents of children aged 0-3 studied by O'Connor and Fotakopoulou (2016) found that 81% used some digital technologies at home but believed that only 6% of their children were using them at nursery or kindergarten. Similarly, 85% of Croatian parents studied by Miklelić Preradović et al. (2016) supported the idea of young children learning more about digital literacies in kindergarten and 75% were willing to participant in an educative workshop. Also families in all income bands in the US study conducted by McClure et al. (2017) wanted more information and advice on choosing good apps. In this connection, Radesky and Christakis (2016) point to the potential role that pediatricians can play in offering good advice (see also Radesky, Christakis & Council on Communications and Media, 2016). However, (Edwards et al. 2017) work from the findings of a mixed method case study in Melbourne, argue against what they claim is a prevailing discourse of digital disconnect between home and preschool for a more complex notion of digital difference. Their empirical work reported on constant tensions, with both groups of parents and educators in the study reporting "a constant negotiation within themselves and with their children regarding access to different technologies, influenced by a complex interplay of their values around the time, place, activity and forms of media (Edwards et al. 2017: 12).

In their study based on an ethomethodological approach, Aarsand and Melander (2016) showed multiple connections between activities which involve children's developing media literacy practices across home and school. They conclude, "In sum, the appropriation of media literacy involves media technology competence but even more importantly it encompasses verbal, embodied and social competences that interact with and are integrated in the participant's cultural knowledge about how to act in specific situations" (Aarsand & Melander, 2016: 30)

Conceptual analysis of the reviewed literature based on Green's 3D model of literacy

Our conceptual analysis of the reviewed literature based on Green's (1988: 160) three-dimensional model of literacy as operational, cultural and critical, as discussed above, reveals that the most dominant focus of existing research is the cultural dimension. Almost all research studies reviewed have addressed young children's digital literacy as cultural practices. Here, parental mediation of children's digital literacy practices has received the most extensive research attention. Research to date has illuminated various parental mediation styles, and how young children's digital literacy practices are entangled with the socio-cultural context of the family, embedded in parent's knowledge-base, values, rules and preferred ways of being and acting with digital technologies and media.

Based on current research evidence, the nature of parental mediation is strongly interlinked with their beliefs concerning risks and opportunities. So parents wish to keep certain possibilities open for children to play, learn, and socialize with digital literacies while limiting others. Interestingly, whereas the risks parents associate with children's engagement with digital literacies and media are fairly well articulated in the research literature, opportunities regarding young children's experiences with digital technologies remain under-specified, even vague. There is hence a need for future research to better address the kind of digital learning opportunities that are available for diverse parents and families in diverse situations.

Another cultural dimension of literacy addressed by a number of studies in our review focus on children's everyday activities with digital technologies and media in homes. These studies range from viewing technologies as interference to children's lives and healthy development, to those studies that illuminate how children's digital literacy practices at home interact and occasionally extend their offline life and activities, including play, and interactions with parents and peers.

At the same time, our review indicates that only a few studies have specifically focused their attention on children's agency or creative use of digital technologies and media in homes; the critical dimension of literacy has received less attention in existing research. This is also to do with scant research on how children's digital literacy practices can further their capacity to ask questions about power, about intended audience and about reception. In sum, these findings from our review call for more research studies with sophisticated research methodologies that are able to capture conditions and processes in which children's agency,

creativity and production of culture – as opposed to only consuming culture - can emerge in their digital literacy practices.

Our conceptual analysis of literature also reveals that to date there is scant research focusing more directly on the operational dimension of children's digital literacy practices in homes. It seems that whereas there are beliefs and hopes of children's digital literacy learning in homes, at present, too little is as yet understood about the ways children learn when they interact with diverse technologies in media in homes that are themselves very diverse. Assumptions that children learn on their own receive challenge from some studies and could merit further investigation.

Furthermore, probing how children learn and what support parents can give them can potentially become more fruitful than the current leading focus on potential risks, potential problems and restrictions, even if for many reasons the latter area of work will and should continue. There is a clear opportunity here for education providers in the early years to take a more informed and supportive role in ensuring young children's digital literacy practices in the home are beneficial.

Conclusions

Our review reflects in nuanced and interdisciplinary ways recent research knowledge of young children's digital literacy practices in homes. Overall, it can be concluded that research attention to this field has significantly grown in number and partially also in focus in the past years. Yet, important areas of research await for further attention. In particular, research attention deserves to be directed to increasing our understanding of the children's perspective, agency, creativity and learning in relation to their digital literacy practices in homes. Further attention could also be paid to understanding children's digital learning lives across the settings they inhabit, so researching how knowledge and practices gained in homes are valued and leveraged for example in early years education and by cultural institutions including libraries and museums (see e.g. Kumpulainen & Erstad, 2017).

Also it needs to be recognised that new technologies and media are being constantly developed, permeating children's homes and everyday lives in general. Examples of most recent developments are the Internet of Toys (more tangible) technologies as well as VR-

technologies. At present, there is a dearth of research knowledge on children's use of these technologies and their implications for their lives and learning in homes and beyond. More research efforts hence need to be directed to these technologies, extending research focuses from touch screen technologies to more tangible ones.

In sum, it can be concluded that the work reported on in this chapter supports the view of Livingstone et al. (2017) that internationally there are many opportunities to enable children to benefit from digital technologies; however, research into local values and practices remains important. Nevertheless, there are lessons to be learnt that have the potential to inform policy and practice in fruitful ways.

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