Young children's use of touch screen tablets for writing and reading at home: Relationships with emergent literacy

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Michelle M. Neumann

Griffith Institute for Educational Research, School of Education and Professional Studies, Griffith University, QLD 4222, Australia

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ABSTRACT

Young children's literacy experiences at home shape the development of emergent literacy skills. Due to the increasing use of touch screen tablets (e.g., iPads) in homes and early education settings it is important to investigate the relationship between digital tools and emergent literacy. The present study examined the relationships between children's ($N = 57$; aged 2–4 years) emergent literacy skills and home use of tablets for writing and reading. Correlational analysis showed a positive association between children's access to apps and print knowledge. A positive association was found between the frequency of writing with tablets and print awareness, print knowledge, and sound knowledge. No associations occurred between emergent literacy skills and frequency of e-book reading. Further research is needed to investigate the effects of tablet writing on emergent literacy development.

1. Introduction

The home literacy environment plays a key role in the development of young children's awareness, understanding, and knowledge of written language such as letters and words (Aram & Levin, 2011; Sylva et al., 2011; Teale & Sulzby, 1986). Through their explorations, young children actively construct their knowledge about reading and writing (Cooper, 2005; Ferreiro & Teberosky, 1982; Korat, Shamir, & Arbiv, 2011; Tolchinsky, 2003). It has been well established that children's early interactions with non-digital tools (e.g., paper-based story books, paper/crayons/paints) through home literacy activities such as writing (e.g., letter and name writing), storybook reading, and identifying environmental print (e.g., signs and labels) positively influences emergent literacy (Aram & Levin, 2011; Neumann, Hood, Ford, & Neumann, 2011; Purcell-Gates, 1996; Whitehurst & Lonigan, 1998). For example, children learn about print through reading and writing of words such as their names (Van der Kooy-Hofland, Kegel, & Bus, 2011). Such early home print experiences lay the foundational blocks for the emergence of literacy skills such as letter name and sound knowledge, emergent writing, print concepts, and phonological awareness that are strong predictors of conventional reading and writing ability (Sénéchal, Le Fevre, Smith-Chant, & Colton, 2001; Welsch, Sullivan, & Justice, 2003; Whitehurst & Lonigan, 1998).

Children's exploration of print via digital tools (e.g., desktop computers) in the home environment also has a positive influence on emergent literacy skills (Hillman & Marshall, 2009; Hisrich & Blanchard, 2009; McManis & Gunnewig, 2012; Van der Kooy-Hofland et al., 2011). For example, e-books can foster word recognition and writing (Shamir & Korat, 2007) and phonological awareness (Korat & Shamir, 2007). Computers have also been shown to be effective writing tools for pre-

schoolers (Yost, 2003) and allow young children the opportunity to engage in writing, drawing, decorating texts, playing games, and searching for information (Downes, 2002). For example, Downes (2002) reports a pre-schooler saying, "I play typing games and I can play painting (p 192)." Digital tools with their multimodal features also enable young children to express themselves and represent their ideas through digital symbols, words, sounds, and images (Downes, 2002). Yost (2003) has shown how kindergarteners ($N = 8$) competently used both digital (desktop computer) and non-digital tools (e.g., crayons, pencils, paper) for a range of writing activities such as creating signs, messages, lists, signing in, and writing stories. Children were observed to transfer their developing knowledge of letter and sound relationships and word spacing between these tools. This illustrates that young children are capable of using digital and nondigital tools for literacy learning.

1.1 Touch screen tablets and apps

Due to the relatively recent release of touch screen tablets (e.g., iPads; Orrin & Olcese, 2011) and increasing home use of these popular digital tools by young children (Livingstone, Marsh, Plowman, Ottovordemgentschenfelde, & Fletcher-Watson, 2014; Ofcom, 2014; Rideout, 2011) little is known about the impact of these devices on children's early literacy learning (Neumann & Neumann, 2014c). Tablets are viewed as a potentially useful learning tool because they are highly intuitive, mobile, and their touch based features make them easy for children to use (Cooper, 2005; Tahnk, 2011). Children as young as two years independently use tablets and apps (downloadable software programs designed for mobile devices e.g., literacy, gaming, and e-book apps; Neumann, 2014a) for playing, creating, and solving problems (Tahnk, 2011).

From a Piagetian perspective, children learn to construct knowledge through their active explorations of reading and writing (Ferreiro, 1986; Sénéchal, 2011). Child tablet behaviours are suggested to reflect natural constructivist child learning (Michael Cohen Group & U.S. Department of Education, 2011). In the pre-school setting, Couse and Chen (2010) have shown how children (aged 3 to 6; $N = 41$) used tablets for drawing and creating a range of linear and circular digital marks. Children quickly learned how to use tablets with ease and were engaged and interested in these digital tools. A more recent observational study has shown that tablets can foster emergent writing experiences. Children ($N = 15$) aged 3—6 years used the iWrite app to create messages, write their name, and type messages on the pop-up keyboard through hunt and peck typing (Bigelow, 2013). Similarly, Beschorner and Hutchison (2013) showed how 4—5 year old children made messages using doodle and drawing apps and moved letters on the screen with their finger to forms words with a magnetic letter app. Two and three year old children ($N = 7$) have been observed in a nursery school to competently use iPads and apps for mark marking and pre-writing activities (e.g., Doodle Buddy and Colouring Zoo app; Price, Jewitt, & Crescenzi, 2015). Other types of literacy apps (e.g., Super Why, Martha Speaks Dog Party) may also foster emergent literacy skills such as letter sound knowledge (Chiong & Schuler, 2010).

While researchers have examined tablet use in the pre-school setting, fewer studies have examined how young children are using these devices for reading and writing in the home environment. One study ($N = 109$) has shown a positive association between home access to tablets and emergent literacy skills (e.g., letter sound and name writing; Neumann, 2014a). However, this study was limited because it only examined children's home access to tablets and not children's use of tablets for specific literacy activities such as reading and writing. A closer examination of home tablet activities will inform the design of further research on using tablets to foster literacy in the home environment.

The present study aimed to investigate types of tablet activities young children are engaging in at home and the associations these activities have with emergent literacy. In addition, relationships between emergent literacy skills and non-digital literacy activities were examined to obtain a broader view of the home literacy environment. Previous studies have emphasised the importance of examining both digital and non-digital home literacy activities (Downes, 2002; Grieshaber, Shield, Luke, & Macdonald, 2011). The research questions of this study were:

(1) What relationships exist between young children's home use of tablets (number of apps used, literacy and gaming app use, tablet typing and writing, and e-book reading) and emergent literacy skills (print awareness, print knowledge, sound knowledge).
(2) Do similar relationships exist between emergent literacy skills (print awareness, print knowledge, sound knowledge) and non-digital home literacy activities (writing, storybook reading)?

2. Method

2.1. Participants

English speaking children ($N = 57$; 29 girls, 28 boys) aged 2—4 years ($M = 42.4$ months; SD = 9.02 months; range = 24.10—55.83 months) from across six childcare centres in south-east Queensland, Australia participated. Ninety-three percent of parents were married and the majority were Australian (mothers 67%, fathers 79%). Most parents (70% mothers, 63% fathers) had gained specialised training (e.g., TAFE) or university degree qualifications. The mean socio-economic status (SES; $M = 45.5$; SD = 10.71; range = 14—63.50) of families was calculated using Hollingshead's index (1975) and fell within the middle SES range (8—66; Hollingshead, 1975).

2.2. Measures

2.2.1. Letter name and sound and numeral name knowledge

Children were asked to say the name (maximum = 26) and sound (maximum = 26) of each upper and lower case letter presented in random order on cards. Children were also asked to report the name of numerals (0–9; maximum = 10) printed on cards presented in random order.

2.2.2. Letter writing

On a blank sheet of A4 paper children were asked to write each letter of the alphabet with a pencil. Each letter was dictated to the child (e.g., Can you write the letter A?). Each correctly written letter (Schickedanz & Casbergue, 2009) was given a score of 1 (maximum = 26; repeated letters were scored once only).

2.2.3. Initial phoneme retrieval

This test was adapted from Aram and Levin (2001). Children were asked to provide the initial phoneme of 10 words (e.g., "What sound does the word *ball* start with?") with a maximum score of 10 (fox, bus, cat, rug, tap, sun, pig, hat, mop, net; Bowey, 1994). Prior to this, children were given three practice word trials (ball, leg, hop) with corrective feedback.

2.2.4. Print concepts

Children's print concepts were assessed using an adaptation of Clay's (2005) Concepts about Print test. Using a storybook (*Stones*; Clay, 2008), children were asked ten questions (e.g., beginning of text, left to right directionality, concept of a word and letter; maximum score = 10).

2.2.5. Home questionnaire

Parents completed a home questionnaire that contained demographic questions (e.g., child age and parent details). Questions on children's use of touch screen tablets asked: list all the apps your child uses and plays at home (the apps listed were totalled to indicate the *number of apps*), how frequently the child: plays literacy apps (*literacy app use*), plays gaming apps (*gaming app use*), types letters and words on a tablet (*tablet typing*), writes letters and words on a tablet (*tablet writing*), reads an e-book (*e-book reading*). Questions on children's non-digital literacy activities (e.g., paper printed books/pencils) asked: what types of writing activities their child does (parent indicated out of six listed writing activities: greeting cards, shopping lists, story writing, labels drawings, name writing, copies letters and words, this was totalled as an indicator of *types of writing*), how frequently the child does: writing in general (*writing frequency*), writes their name (*name writing frequency*), writes alphabet letters (*alphabet letter writing frequency*), and shared storybook reading (*storybook reading*). Parents indicated how frequently their child engaged in writing and reading activities on a 6-point scale (1 = *never*, 2 = *occasionally [less than once per fortnight]*, 3 = *fortnightly*, 4 = *weekly*, 5 = *daily*, 6 = *several times daily*).

2.3. Procedure

The ethical conduct of the project was approved by the institutional ethics review committee of the university. The childcare centres provided permission for the research to be carried out and consent was provided by parents prior to their child's participation. Children completed a 20 min emergent literacy assessment (print concepts, letter name and sound knowledge, numeral name knowledge, letter writing, initial phoneme retrieval) at the child's childcare centre. Parents completed the home questionnaire about family demographics and home literacy and tablet activities.

3. Results

3.1. Descriptives of emergent literacy and home measures

The descriptive statistics for the emergent literacy measures, as shown in Table 1, indicated that children had some knowledge of where to start reading, left to right directionality, and concepts of words and letters. Children knew on average 20% of letter names, 10% of letter sounds, and could write three letters correctly with limited abilities to retrieve initial phonemes. The tablet and non-digital home literacy activities, as shown in Table 2, indicated that children on average used four apps at home and played with literacy and gaming apps on a weekly to fortnightly basis. Children typed, wrote on tablets, and read e-books less frequently (less than once of fortnight). Children did writing (e.g., name and alphabet writing) with non-digital materials on average once a fortnight and engaged in two types of writing activities. Parent reading of paper-based storybooks was the most frequent home literacy activity occurring on a daily basis. Overall, children had limited emergent literacy skills but participated in a range of digital and non-digital literacy activities at home.

3.2. Correlational analyses

Emergent literacy measures were divided into three factors 1) Print awareness (Concepts about Print), 2) Print knowledge (upper and lower case letter name, numeral name, letter writing), and 3) Sound knowledge (upper and lower case letter

Table 1
Descriptive statistics for emergent literacy measures (N = 57).

Measures	Mean	SD (range)
Print awareness		
Print concepts (max. = 10)	3.28	2.41 (0—9)
Print knowledge		
Upper case letter name (max. = 26)	5.21	7.69 (0—26)
Lower case letter name (max. = 26)	4.35	7.38 (0—26)
Numeral name (max. = 9)	3.11	3.83 (0—10)
Letter writing (max. = 26)	3.19	5.09 (0—25)
Sound knowledge		
Upper case letter sound (max. = 26)	2.07	4.69 (0—21)
Lower case letter sound (max. = 26)	1.82	4.61 (0—21)
Initial phoneme awareness (max. = 10)	1.32	2.99 (0—10)

Table 2
Descriptive statistics for home tablet and home non-digital literacy activities (N = 57).

Measures	Mean	SD (range)
Home tablet activities:		
Number of apps	4.14	4.85 (0—25)
Literacy app use (max. = 6)	3.28	1.51 (1—6)
Gaming app use (max. = 6)	3.52	1.71 (1—6)
Tablet typing (max. = 6)	1.77	1.18 (1—5)
Tablet writing (max. = 6)	1.74	1.17 (1—5)
E-book reading (max. = 6)	1.60	1.05 (1—5)
Home non-digital activities:		
Writing (max. = 6)	3.47	1.75 (1—6)
Name writing (max. = 6)	2.74	1.82 (1—6)
Alphabet letter writing (max. = 6)	2.75	1.71 (1—6)
Types of writing (max. = 6)	1.98	1.59 (0—5)
Storybook reading (max. = 6)	4.95	0.74 (2—6)

sound and initial phoneme retrieval) as seen in Table 1. This variable grouping is based on principal component analysis of the underlying measures as determined by previous studies (Neumann, 2014b; Lonigan, Burgess, & Anthony, 2000; Sénéchal et al., 2001). Print awareness, literacy app and game app use, writing activities, name and alphabet writing activities, and types of writing were normally distributed. The remaining variables (print knowledge, sound knowledge, number of apps, tablet typing and tablet writing, and e-book and storybook reading) required a logarithmic transformation to normalise the data.

Child age was positively associated with emergent literacy and home measures and was partialled out of the analyses. Correlations among emergent literacy measures and home tablet activities are shown in Table 3. After controlling for child age, correlational analysis indicated that children who had access to a greater number of apps had greater print knowledge. Children who more frequently used tablets for writing had greater print awareness, print knowledge, and sound knowledge. No association was found between tablet typing and emergent literacy. Likewise, emergency literacy was not related to the frequency of literacy app and gaming app use and not related to e-book reading.

The correlations between emergent literacy measures and non-digital home activities are shown in Table 4. After controlling for child age, correlational analyses showed that children who engaged more frequently in non-digital writing activities at home such as name and alphabet writing had greater print and sound knowledge (Table 4). Children who participated in a wider range of writing activities had greater print knowledge. Emergent literacy measures were not related to storybook reading.

Table 3
Correlations among emergent literacy measures and home tablet activities, controlling for child age (N = 57).

	1	2	3	4	5	6	7	8
1. Print awareness	—							
2. Print knowledge	0.43**	—						
3. Sound knowledge	0.26	0.43**	—					
4. Number of apps	0.19	0.30*	0.14	—				
5. Literacy app use	0.14	0.11	0.20	0.55**	—			
6. Gaming app use	-0.10	-0.19	0.08	0.37**	0.60**	—		
7. Tablet typing	0.13	0.19	0.15	0.34*	0.28*	0.25	—	
8. Tablet writing	0.30*	0.41**	0.40**	0.32*	0.40**	0.19	0.48**	—
9. E-book reading	0.05	0.14	0.10	0.24	0.26	0.26	0.27*	0.06

*$p < 0.05$, **$p < 0.01$.

Table 4
Correlations among emergent literacy measures and non-digital home literacy activities, controlling for child age (N = 57).

	1	2	3	4	5	6	7
1. Print awareness	–						
2. Print knowledge	0.43**	–					
3. Sound knowledge	0.26	0.43**	–				
4. Writing	0.28*	0.37**	0.14	–			
5. Name writing	0.19	0.49**	0.43**	0.70**	–		
6. Alphabet writing	0.25	0.44**	0.29*	0.47**	0.55**	–	
7. Types of writing	0.15	0.29*	0.14	0.61**	0.55**	0.43**	–
8. Storybook reading	0.05	-0.13	-0.01	-0.10	-0.04	-0.03	-0.07

$*p < 0.05$, $**p < 0.01$.

4. Discussion

The home environment has an important impact upon children's early literacy development (Aram, Korat, & Hassunah-Arafat, 2013; Purcell-Gates, 1996). Due to the increasing use of tablets and apps by young children (Livingstone et al., 2014; Ofcom, 2014) and limited research on the use of these devices in the home, the present study examined relationships between specific aspects of home tablet use for reading and writing and emergent literacy skills. To gain a broader view of home literacy practices, non-digital literacy activities were also examined. The findings showed a positive association between tablet writing at home and print awareness, print knowledge, and sound knowledge. In addition, non-digital writing activities showed positive associations with emergent skills. Taken together, it would seem that regardless of the tools children used (digital or non-digital) writing is a key activity that is related to literacy development in the home.

4.1. Tablets and emergent literacy

Young children from two years of age can independently use tablets to engage in a range of early literacy activities (Michael Cohen & U.S. Department of Education, 2011). The present study found that children aged 2–4 years who used tablets more often at home for writing had greater print awareness and letter and sound knowledge than children who used them less frequently for writing. This highlights potential benefits of tablet writing for emergent literacy learning. A tablet's touch-based features provides a way for young children who have not yet fully developed their fine motor skills to easily make marks with their fingers and express themselves (McManis & Gunnewig, 2012). It is well known that young children naturally explore print through name writing, and message making through non-digital tools (Levin, Both-De Vries, Aram, & Bus, 2005; Mayer, 2007). Tablets provide further valuable opportunities for pre-school children to develop emergent writing skills through experimenting with drawing and writing apps (Beschorner & Hutchison, 2013; Crescenzi, Jewitt, & Price, 2014).

Based on the present findings and previous observational work (e.g., Beschorner & Hutchison, 2013) it is possible that tablets have the potential to be effective writing tools for young children. Parents in the current study reported examples of writing apps (e.g., iWrite words, Write my name, ABC tracing) and drawing apps (e.g., Edupaint, Kids play paint, Drawing book, Painter star) their child used at home. It is possible that through the use of these writing apps children were engaging in activities such as scribbling, writing and copying letters and words. Such tablet writing activities may be promising home activities to foster children's print knowledge. However, correlation does not demonstrate causation and further work is needed to determine the types and specific causal effects of tablet writing on young children's emergent literacy development.

No relationship occurred between tablet typing and emergent literacy in the present study. The children were of a young age knowing on average only five upper case and four lower case letters. Although speculative, using a pop-up keyboard for message making (e.g., creating emails, stories, using google to type search words) may require greater mastery of specific skills (e.g., alphabet letter and keyboard knowledge) before tablet typing abilities emerge. Also, the extent of parental assistance during tablet typing might be an important factor that influences children's use of the pop up key board. For example, Bigelow (2013) described how three to four year old pre-school children used hunt and peck typing to write their name or create messages and highlighted the important role of teachers in assisting children. For example, when children used the iWrite app the pre-school teacher helped children identify and spell words by pointing out keyboard letters.

The present study showed that young children who played with more apps at home such as literacy, writing, and gaming apps had greater print knowledge. However, these associations cannot be confirmed until further research empirically tests the causal effects of these specific types of apps on emergent literacy. For example, some apps may focus mainly on fostering emergent writing skills whereas others may include features that support both emergent writing and reading skills. The quality of apps is also an important factor to consider, for example, whether the app is based on rote learning tasks or creative and problem solving activities that engage and scaffold children's learning. The lack of relationship found between children's use of literacy apps and emergent literacy skills may reflect other possible influencing factors such as the quality and features of apps.

However, it was interesting to note that the use of literacy apps was positively associated with tablet writing and typing whereas there was no association between children's use of gaming apps and tablet writing and typing. As the gaming apps

used by children in the present study (e.g., Temple Run, Fruit Ninja, Angry Birds, Ninja Run, Subway Surfer, Minion Rush, Candy Crush, Crossy Road) comprise mainly of repetitive swiping or tapping actions rather than writing or typing, it was not unexpected to find this lack of association. It is possible that compared to gaming apps, literacy apps may possess certain features that engage children in typing and writing activities and therefore may be more useful for fostering emergent literacy. It is clear that more work needs to be done to tease out the differential effects of apps on emergent literacy and compare their effects on younger and older pre-schoolers' development.

4.2. Home digital and non-digital activities

Children in the present study engaged in both reading and writing activities at home using non-digital tools (e.g., paper/pencil, paper based story books) and digital tools (e.g., tablet writing, tablet typing, e-books). Similar to the tablet findings in the present study, writing with non-digital tools was positively associated with print awareness, print knowledge, and sound knowledge. Children who engaged in more types of writing activities (e.g., writes greeting cards, labels drawings, creates stories) had greater print knowledge. In contrast, no relationships were found between emergent literacy measures and storybook or e-book reading frequency. This finding aligns with previous research showing that print-based activities are more strongly associated with code-base skills (e.g., alphabet knowledge) and storybook reading predicts the development of language, comprehension, and vocabulary skills (Hood, Conlon, & Andrews, 2008; Sénéchal, Le Fevre, Thomas, & Daley, 1998; Sénéchal & LeFevre, 2002). As language-based skills were not measured in the current study the present findings are not unexpected. In addition, young children rarely look at the print during storybook reading unless it is pointed out to them (Evans & Saint-Aubin, 2011). A lack of association between storybook reading and print concepts (e.g., left to right directionality) may be linked to the types and quality of print-based interactions children have with digital and non-digital storybooks.

4.3. Practical implications

The findings of the present study show that the home environment provides opportunities for young children to explore print via digital and non-digital tools. More specifically, as home tablet writing was positively related to print awareness, print knowledge, and sound knowledge, tablets may be a useful digital tool to engage pre-school children in writing at home. Previous studies have observed how through touch experiences (e.g, using an index finger) tablets engage even very young children in mark making, drawing (Price et al., 2015), letter shaping, and creation of messages and stories (Beschorner & Hutchison, 2013; Bigelow, 2013). These pre-writing activities have the potential to lead to the development of reading and writing skills and digital skills (e.g., tap, press, swiping, and forming straight and circular strokes; Price et al., 2015). From a practical perspective, some pre-schoolers prefer using tablets over non-digital tools because tablet colours are brighter, the ink never runs out, and paint brushes do not need cleaning (Couse & Chen, 2010). Yost (2003) argues that children should be provided with opportunities to select and use digital and non-digital writing tools.

Tablets may also lift limitations on emergent writing activities as children do not require a high level of fine motor skills (e.g., using a computer mouse). For example, children can use the pop up keyboard to create more complex messages and stories they would otherwise be unable to do if they had to use paper and pencil (Beschorner & Hutchison, 2013; Bigelow, 2013). Interestingly, Bloodgood (1999) reported that in some 3 and 4 year old children with limited fine motor skills, a significant discrepancy existed between their alphabet knowledge and their ability to write their name with a pencil. Therefore, touch screen tablets may provide children at different stages of their emergent writing development (e.g., scribbling, letter-like forms, conventional letters; Welsch et al., 2003) an alternative tool to express and produce their emerging understandings about written language.

It is also important to note in the present study that although positive associations were found between home writing activities and emergent literacy skills, children on average engaged in home writing activities only once a fortnight whereas paper-based storybook reading occurred on a daily basis. Due to research emphasising the benefits of encouraging children to explore mark making and writing through digital and non-digital tools (Aram & Levin, 2011; Beschorner & Hutchison, 2013; Neumann & Neumann, 2010; Yost, 2003) more work needs to be done to stress the importance of home writing activities in general.

Cooper (2005) argues for the importance of human interaction in the creation of a positive digital environment. It is likely that parents play a significant role in scaffolding children's writing on tablets for a variety of purposes such as searching a website, typing an email, playing a writing game, or creating a story. Therefore, examining how parents scaffold their child's writing on tablets is essential as parent-mediation of writing with paper and pencil is positively associated with emergent literacy ability (Aram et al., 2013). Also, adult scaffolding during e-book reading is necessary for fostering emergent literacy skills (Korat et al., 2011). More research is required that examines tablets and the home environment so that families can be provided with clear advice on how tablets can best support early learning at home.

4.4. Limitations and future research

Due to the correlational design of the present study it is important to keep in mind that a positive correlation does not imply causation. However, the findings can direct future research to more closely examine the effects of home tablet writing

on emergent literacy. For example, this could be done by conducting a randomly controlled pre-post-test intervention design study that compares the effects of using tablet writing and e-book reading on a wider range of early literacy and language measures. In addition, through observations of parent-child interactions with tablets it may be possible to determine types of scaffolding strategies parents are using to support emergent literacy learning. A further limitation of the study was that the parent-report questions were based on the frequency of use which does not provide a measure of proficiency for typing or writing on a tablet. Therefore, developing validated assessments that measure digital literacy competencies will provide a clearer view on the impact of tablets on children's development (Javorsky, 2014).

In addition, self-report questionnaires can be subject to social desirability bias (Boudreau, 2005). It is possible that parents in the present study overestimated reading of paper-based story books and underestimated child use of apps due to certain views that young children are spending too much time on tablets. For example, Australian and UK mothers have been reported to express concerns about their children's use of technology fearing that the addictive features of tablets could negatively impact upon social skills and appreciation of non-digital literacy tools (Grieshaber et al. 2011; Livingstone et al., 2014). Therefore, in addition to studying the relationship between tablet use and literacy learning and cognitive development it is also important to investigate the relationship between tablet use and young children's social and physical development. This will provide further insights into the benefits and hindrances of home tablet use.

5. Conclusion

The positive relationship found between tablet writing in the home setting and emergent literacy requires further investigation. Questions also arise about how apps and tablet writing activities (e.g., writing with a finger or typing on a pop up keyboard) affect the development of emergent literacy and how parents and carers scaffold children's tablet writing. Engaging young children in the creative act of mark making and writing via tablets has the potential to foster aspects of emergent literacy however future empirical work is needed to determine this.

Acknowledgements

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