Is An Increased Use of 21st Century Technology Impacting On Children's Early Speech, Language and Communication Development?

Pen Portrait: NICHOLA GOUGH

I joined the University Centre Doncaster to undertake a Foundation Degree in Early Childhood Policy and Practice in 2012. After successfully completing the Foundation Degree I decided to continue with my studies further by completing a BA (Hons) Top-Up in Early Childhood Studies. I have enjoyed the last four years studying at the University Centre, and through the knowledge and understanding gained I have been able to successfully progress within my chosen career pathway; Outreach worker based in a Children's Centre.

Abstract

The continuing developments of 21st Century technologies are producing an increased use of hand held electronic devices within early childhood (Siraj-Blatchford and Whitebread, 2005; Formby, 2014). Children are being introduced to technologies such as smart televisions, computers, smartphones, and tablet devices as well as other hand held appliances from an early age. Such technologies are becoming progressively popular within the home and becoming an accepted form of entertainment, whilst within school learning environments technology is becoming an increasingly popular tool for teaching, with the use of smart boards and i-Pads within the classroom.

The aim of the study is to examine how 21st Century technology is accessed by children and parents, and any significant effects this may have on children's speech, language and communication development. The study gives particular focus to the use of hand held electronic devices within the HLE.

The research uses a multi method approach of data collection using parental questionnaires, field notes and a child focus group, and draws upon current research, government documentation and theories of language development to correlate the research findings.

Findings concurred that all 3 and 4 year olds within the case study are given access to hand held electronic devices within the HLE, which is often unsupervised by adults resulting in a reduction of social interaction taking place between the adult and child. Findings also suggest the lack of support or supervision given to children when accessing such devices could be having an impact on children's speech, language and communication development from a young age.

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or supervision given to children when accessing such devices could be having an impact on children's speech, language and communication development from a young age.

Chapter 1 Literature Review

1.1 Theory of Language Development

Human ability to interact with one another through the use of language is the main factor separating humans from the rest of the animal kingdom. Although many animal species 'communicate' with one another, none have been identified to use anything similar to a language system (Davenport, 1992; Daly *et al*, 2006). There are three main theories in the development of language. The learning reinforcement theory developed by Skinner (1957) was based on behavioural reinforcement principles by associating words with meanings. Skinner believed language development was formed from the child's environmental influences, as positive reinforcements to sounds made by the child would help to develop the child's understanding of language and the communicative value of words. Chomsky (1976) developed a nativist perspective, believing children to be preprogramed with an innate ability to acquire language and proposed that all humans have a 'language acquisition devise' (LAD), containing knowledge and grammatical rules common to all languages, enabling children to understand the rules of whatever language they are listening to. The first years of life are crucial to a child's communication development, as this is when the brain is most receptive to learning new languages and building communication pathways, and so the language acquisition devise operates most effectively within the early years (Watt, 2010, Roulstone *et al,* 2011, and Carrie 2014). The interactionist or the social interactionist approach is a method in which biological and social factors have to interact in order for children to learn language. Vygotsky (1962) believed in the social interactionist approach and stressed the importance of communication with others as a major factor in the development of a child's language, and identified the important role an adult has on the development of children's language. Vygotsky's theory describes the importance of the zone of proximal development, which is present in interactions children have with adults. This zone is described as the distance between the child's actual development level determined by independent problem solving and the level of potential development as determined through problem solving through adult guidance, referred to as scaffolding. Building upon the LAD concept, Bruner (1983)

believes the verbal and non-verbal interactions adults have with babies and young children support the development of a language acquisition support system (LASS), supporting early language development as children begin to take part in limited communications with adults or other children with their language developing only through social interactions. Gradually young children then add to these limited communications, internalise them, and widen them into a whole language system of inner speech that they draw on to express a wide range of concepts to themselves and to others Bruner (1983). It is also believed that there is a close connection between the development of children's thought processes and the development of language skills (Bates,1976; Goswami and Bryant 2007).Skinner; Chomsky; Vygotsky and Bruner recognised the importance of appropriate language models, and believed adults shape the speech of infants and young children as language skills begin to develop, through the reinforcement of vocalisations and the making of sounds during infancy. Speech, language and communication development will only work effectively if children have the means to communicate through non-verbal and paralinguistic methods of expression, have reason to communicate with a purpose for the interaction, as well as opportunities to share language and other forms of communication (Money and Thurman, 1994). As described within the Micro System of The Ecological systems Theory, the direct environment in which children live have an effect on how the child learns and develops, including relationships and organisations they interact with. The more nurturing and encouraging the relationships and environments, the healthier the child's overall social and emotional development will be (Bronfenbrenner, 1979). Models of language acquisition stress the importance of human interactions in developing language skills, and value communication skills as being able to interact with others not only through speech, but by responding to body language of others and also the ability to socially interact with others (Bishop *et al*, 2000; Botting and Conti-Ramsden, 2000; Bishop, 2001; Howe and Mercer, 2007; Carrie, 2014).

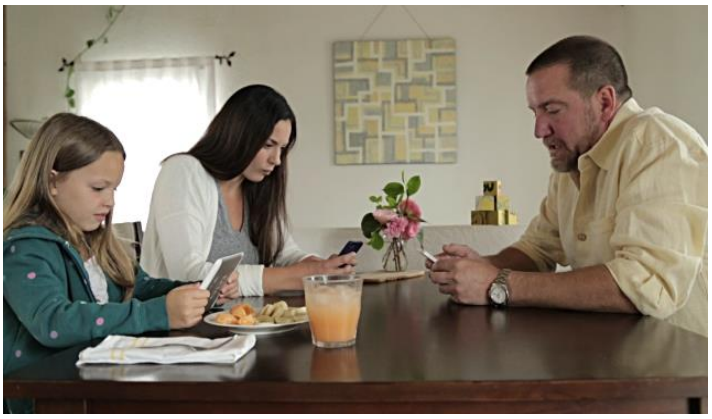
1.2 The Home Learning Environment

Babies thrive when given attention from their carer, and begin to mirror facial expressions from a very early age (Tarver, 2013). Babies stare into the eyes of their caregiver, looking for a reaction, and the response received stimulates the brain and begins to build and strengthen neural pathways (Davenport, 1992; Nicholas, 2012). Mesman *et al* (2009) highlights potentially harmful emotional, social and developmental impacts when a mother stops responding to her baby with appropriate facial expressions, and identifies the lack of response could lead to ruptures in the child's ability to form suitable attachments as a child and later in life. Adult two-way interactions with children are essential to the development of young children's speech and language, and continuous engagement in language interactions with young children provides positive outcomes within all areas of early child development (Morrison Gutman and Feinstein, 2010). Children living in low income households hear significantly less language than those from more affluent backgrounds. An average of 600 words per hour are spoken within low income families, rising to an average of 1250 words within working class households and around 2200 words spoken per hour from professional families. In addition to the increased vocabulary, the type of communications heard also differ, with more affluent families using around six times more positive praise and encouraging comments around their children (Hart and Risley, 1995). Girls also tend to begin to talk earlier than boys, beginning to show understanding of what is being said to them sooner, resulting in girls communicating using gestures more readily from a younger age. This continues through early childhood, although the gap narrows at around 3 years when boys also become more vocal in their communications (Ozcalskan and Goldin-Meadow, 2010; Sandle, 2013; Sethi 2016). The Effective Provision of Pre-school Education (EPPE) study highlighted the important function the HLE has on intellectual and social development, in which parents actively engage with their children to provide a wide range of experiences (Sylva *et al* 2004). Parents have the ability to enhance children's learning potential through provision of a literacy rich HLE, incorporating speech, storytelling and reading into everyday activities. As children listen to adults

talk, tell stories and read books aloud from an early age, basic sounds start to be distinguished to later form the fundamentals of language and communication skills along with listening and attention skills, as well as fostering strong relationships between parent and child whilst engaging in a quiet nurturing activities together (Early moments, 2015; Kids Health, 2016).

The introduction of the Book Start Programme in 1998, which supplies children from birth to 3 with age free appropriate books to share at home with parents, along with parental support strategies and advice on how to encourage literacy at home, found that children accessing literature prior to entering school have increased attainment levels throughout the primary years (Wade and Moore, 2000). The programme has since been taken up nationally with 92% of local authorities distributing books

through the provision of government funding (BookTrust, 2016). The Dolly Parton Imagination Library, founded by Dolly Parton in east Tennessee in 1996, also attempts to encourage a love of reading through the monthly distribution of free age appropriate story books for children from birth to 5 years. The programme has since been rolled out within countries across the world including the United Kingdom, providing all children registered on the programme a range of stimulating books to share at home, with the hope that parents will be inspired to share social interactions with their children, and begin to engage children through the use of stories rather than advancements in technology (Parton, 2016).



Parental attitudes towards the use of mobile phones and tablet devices have been criticised as a major contributor to the increased number of children displaying communication and language difficulties, mainly due to the parents failure to positively role model the appropriate use of technology, and the lack of interaction between parent and child is leaving school aged children unable to verbally communicate (Roxby, 2013; Firestone, 2014; Hunt, 2015). Handheld devices are becoming barriers to children's early speech and development, as parents are becoming increasingly distracted by their own electronic devices, becoming less attuned to their children and missing the harmful effect this is having on learning, development and self-esteem, by ignoring their child (McCrum, 2015; Ascharya, 2016), and children raised in deprived language environments can struggle, particularly with the development of social communication (Bishop, 2001). Advancements in technology are changing the way children play and learn about the values and practices of their culture, social interactions and play experiences are becoming increasingly technological based, thus producing an increased risk of first hand face-to-face contacts being reduced, therefore it is imperative adults continue to support children's social learning opportunities through everyday experiences (Goldstein, 2013; Levin, 2013).

In 2014, 84% of households in Great Britain had internet access, and 'mobile internet' usage for mobile phones and other handheld devices more than doubled from 24% in 2010 to 58 percent in 2014, with 38 million adults accessing the internet on a daily basis (Office for National Statistics, 2014). Children's usage of touchscreen electronic devices between 5 and 15 years, tripled from 2012- 2013, and 28% of 3 and 4 year olds accessed touchscreen devices on a daily basis within their home environment (Formby, 2014). The effect of rapidly advancing technology within the 21st Century is impacting on the everyday life of families, with increased numbers of parents purchasing tablets and other swipe screen devices for their children (O'Sullivan [n.d.]). Children spend an average of 7 hours per day connected to entertainment media, including televisions, computers, mobile phones as well as

other electronic devices. Households with a multitude of media entertainment suggest there to be a reduction of social interactions taking place within the home, believing family members are spending less time together and more time independently using technology than was the case a decade ago (Palfrey and Gasser, 2008; American Academy of Pediatrics, 2015; Carlyle, 2016). With the increasing use of technologies within the home parents need to be able to demonstrate that tasks in the 'real world' are important by positively role-modelling interactions with devices, as children raised in very deprived language environments are beginning to struggle, particularly with the development of social communication, and it is vital that parents begin to value time spent with their children (Bishop, 2001; Gresko, 2013; Carlyle, 2016). Gresko states '*smartphone usage starts now, when they're young, and it begins with the parent*' (pp.1). Mobile devices are extremely engaging for children and can offer interactive experiences to enhance language and communication skills, however positive role- modelling from adults through a provision of appropriate learning experiences is needed, by limiting children's screen time and incorporating collaborative language interactions to build vocabulary and complex sentence modelling by sharing screen time with their children, rather than allowing children to access devices unsupervised (Siraj-Blatchford and Whitebread, 2005; Sweeney, 2011; Carlyle, 2016).

1.3 Current Research

The world in which children are learning surrounds them with electronic ICT equipment, gadgets and toys, which are starting to have significant impacts on their lives (Siraj-Blatchford and Whitebread, 2005; Veale, 2012). Many children develop speech and language skills effortlessly, however in 2012 there was a 70% increase of children identified with speech problems between 2005 and 2011, and 50% of children identified within the United Kingdom, particularly those from areas of social disadvantage, to be starting school with delayed language leaving them without the communication skills needed for them to make friends and communicate with teaching staff (Clark, 2012; Grist, 2015). Studies carried out within socially disadvantaged areas identified almost 50% of children living in these communities to have significant language delays, primarily due to the environmental factors limiting

the development of children's communication skills (Locke *et al,* 2002; Law *et al,* 2011). Communication and language is presented as one of the three prime areas of learning within the Early Years Foundation Stage (EYFS), focussing on the development of oral skills as well as listening to and understanding of spoken language from birth through to the end of Key Stage 2, taking into account children's ability to communicate appropriately with others (DfE, 2014). Language development is an important predictor of academic achievement, providing children with the tools they need to interact with others and represent thoughts, feelings and experiences, and is therefore vital for children as they develop (Snowling and Stackhouse, 2006; Stein *et al*, 2008; Department for Education, 2008; Roulstone *et al*, 2011). Without a firm foundation of language skills children find it increasingly difficult to learn to read, as language and literacy work together to scaffold further development, and 50-90% of children with persistent speech, language and communication difficulties go on to have further reading and writing difficulties, resulting in only 25% of children achieving the expected level in English by the end of Key Stage 2 (Stothard *et al,* 1998; Department for Education, 2008; The Bercow Report, 2008; The Communication Trust, 2011). Communication skills are paramount to children's education, and young children are lacking school readiness due to poor language and communication abilities, particularly those from socially disadvantaged backgrounds (Marmot, 2010; Field, 2010; Allen, 2011; Tickell, 2011). Speech, language and communication difficulties not only affect children's school performance, but are also identified in a range of long term consequences in terms of literacy, mental health and employment in adulthood (Law *et al*, 2009). High quality learning experiences with well-trained early years practitioners have been identified as effectively preparing children for later learning, and children attending provisions employing practitioners with higher level qualifications have been shown to make more developmental progress (Sylva *et al*, 2003).

The Every Child a Talker (ECaT) programme established in 2008, was developed to improve the skills and expertise of early years practitioners in supporting early language development throughout England, helping practitioners identify children at risk of developing language and communication delay as well as improving language provision within the settings. ECaT encouraged partnerships with parents and focussed on the involvement of parents in their children's learning, helping to

develop a stronger HLE. The ECaT programme created significant positive outcomes for children's early language development, by improving language provision, encouraging parental engagement and enhancing the expertise of practitioners, producing considerable evidence of a reduction of children at risk of language delay (DfE, 2008; DfE, 2011). However The Better Communication Research Project, still suggested additional support was needed within the early years for children from disadvantaged backgrounds to help secure firm foundations for language and literacy development (Snowling *et al*, 2011), which lead to the introduction of the Early Language Development Programme (ELDP). The ELDP provides national training funded by the Department for Education, to provide additional support to further upskill practitioners working with families to confidently assist parents and their children in the development of early language much like the ECaT programme (ICAN, 2015).

From September 2015 children aged 24 months are to have progress checks to track developmental achievements through the EYFS learning outcomes. The check which is carried out by early years practitioners will then be brought together where possible, with a developmental review carried out by health visitors in correlation with the Healthy Child Review, to form a joint health and education review known as an integrated review. As professionals working with the children are able to combine the reviews, early identification of difficulties displayed by children can be highlighted, and the implementation of strategies can be introduced to support children's individual needs (National Children's Bureau, 2015).

In 2006 it was estimated that £4.1 billion would be spent providing special education for children with persistent speech, language and communication difficulties. With the costs to society increasing still as young people not in education, employment or training averages £97,000 over a lifetime due to an increased risk of behavioural difficulties, potential criminal activities and mental health issues as a result of underachievement within school (Hartshorne, 2006; Education and Skills Committee, 2006).

1.4 Current Practice

To provide children with better opportunities in later life and adulthood, the EYFS incorporates the use of ICT within the specific areas of development, with the subsequent goal of children being able to use technologies independently for particular purposes (DfE, 2014). Research has shown that good educational delivery methods used through ICT can enhance young children's learning, helping to support their number and letter recognition, phonic knowledge and their ability to use and understand written words and story concepts through watching and interacting with a variety of media (Jennings *et al*, 2009; Penuel *et al*, 2012). The National Association for the Education of Young Children (NAEYC) identify a responsibility early years educators hold to what impact the use of technology has on children's development and to what means the use of technology has to benefit children within the school learning environment (Siraj- Blatchford and Whitebread, 2005). NAEYC subsequently support the use of technology in early years education with the use of developmentally appropriate and intentional delivery methods (NAEYC, 2012).

The use of technology in early years education, with the use of developmentally and age appropriate applications installed are recognised as a helpful, interesting tool which can help to teach children skill sets such as vocabulary building, phonological awareness and articulation skills, as well as improving computer literacy and the ability to navigate such devices, helping to facilitate children's developing understanding of technology when practitioners provide appropriate support and guidance through purposeful delivery methods (Swallow, 2012; NAEYC, 2012; Roxby, 2013). Hand-eye coordination, problem solving skills, and ability to visually process information can be improved by implementing an increase of technology in children's play, and it is suggested that technology focussed play could also enhance physical activities such as sports, by acting as models for performance and motivation in the real world (Digiparenthood, 2013 and Bergen *et al*, 2015).

Although computers and hand held devices are becoming increasingly accessible to children, the use of technology within classroom learning environments remains infrequent, especially in early childhood education (Vockley and Lang, 2011; Wartella *et al*, 2013). Practitioners need to be available to assist children's appropriate use of such devices in order to facilitate their learning, as young children require adult guidance and support rather than being left to play with devices randomly (Plowman and Stephen, 2007). Within a report carried out by the National

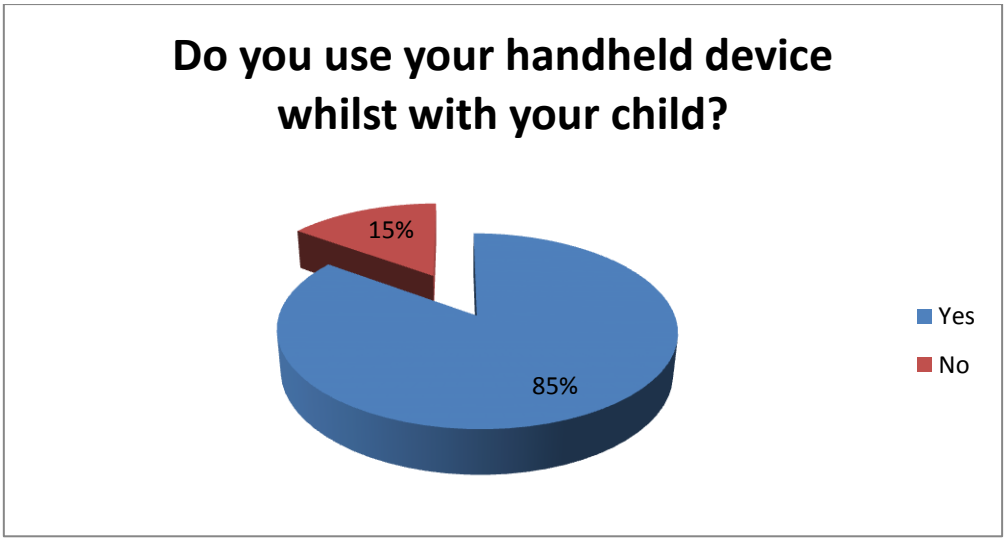
Literacy Trust, 94.7% of children would only access touch screen devices within early educational provision with an adult present in order to facilitate sustained shared thinking into the activity (Formby, 2014). The use of technology based resources for story- telling and to facilitate developing literacy skills are becoming increasingly popular within early years environments, helping to improve children's reading abilities (Ramasubbu, 2015). Practitioners working with children and encouraging the use of technologies need to be confident with their own ability to use devices in order to facilitate collaboration and optimise sustained shared thinking, although practitioners often lack in the confidence to use ICT due to their own lack of knowledge, and the availability of ICT within early years provisions are often limited, which can subsequently result in limited communications between parents and educators around children's experiences with technology (Siraj-Blatchford and Whitebread, 2005). The Research in Effective Pedagogy in the Early Years (REPEY) and Effective Provision of Preschool Education (EPPE) studies gave expectations of practitioners having sounder skill sets with ICT when qualified to graduate level due to their level of study, as well as providing a better quality of teaching within the learning environment (Siraj- Blatchford *et al,* 2002; Sylva *et al*, 2004), so should have the confidence to work competently with ICT within the educational environment. However practitioners report a lack of confidence using ICT with children and an uncertainty of the value of technology usage, expressing concerns regarding the underdevelopment within the three prime areas of development within the EYFS (DfE, 2014) of young children upon starting school, due to increased levels of involvement with ICT. Within early educational environments print based resources are still predominantly used to encourage basic language and communication rules to then facilitate later literacy skills, with 100% of early years provisions providing children with access to reading materials on a daily basis (Flewitt, 2012; Formby, 2014).

Chapter 2 Research Findings

2.1 Parental Influences

It is clear from the data collected that adult participants use their own personal electronic devices on a daily basis (Appendix 38), with 85% of parents stating they use their device whilst in the presence of their child (Figure 1).

Figure 1: Results of parental questionnaire, question 10.



This was confirmed by all 4 participants of the child focus group (Appendix 33, Figure 2).

Figure 2: Children's communications within the child focus group.

R	Yeah, daddy plays that game on his…he as got to swap the colours, but mummy does emails all the time	
T	My mummy as email on her phone and daddy goes on his i-Pad lots	
E	My mummy goes on the computer and does writing	Smiling Excited tone to her voice

	for emails but she does play on her i-Pad too. Daddy looked at Disney Land holiday on the i-Pad though	
H	My mum goes on her phone lots and plays games and dad does that thing when you match the shapes	Moves finger in a swiping motion across the table

This supports the findings of Roxby (2013), Firestone (2014) and Hunt (2015), indicating parental attitudes are influencing children's use of technology within the HLE, to the determinant of social interactions between adults and children whilst either one are engaged with electronic devices, resulting in delays in children's speech, language and communication development (McCrum, 2015 and Ascharya 2016).

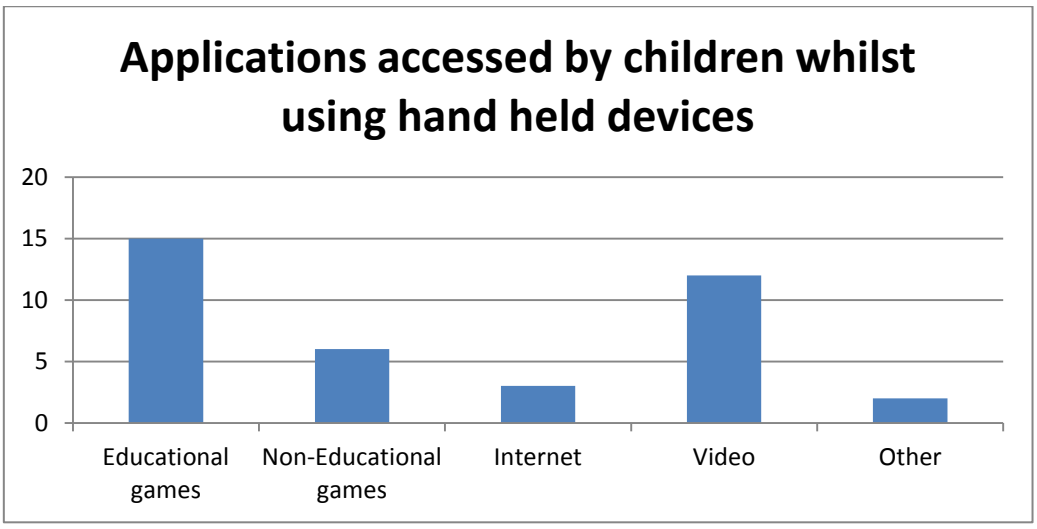
These suggestions are supported by the prolonged periods of silence recorded within the field notes; observations 1-4 (Appendices 34- 37), in which 11 minutes and 33 seconds of silence are recorded between the 4 observations lasting a total of 29 minutes 26 seconds, as the children observed engage with the i-Pads provided. The children observed within observations 1-4 (Appendices 34- 37) showed little social interaction with one another whilst using the i-Pads, other than using the camera applications. The use of the camera application recorded children conversing with one another; however this was mainly to gain the attention of each other when taking photographs, and rarely produced valuable conversational exchanges between the children.

As children played independently on game applications installed on the i-Pads, interactions with one another decreased which is identifiable throughout the transcripts of the field note observations (Appendices 34- 37). Drawing attention to observation 2 (Appendix 35), child 'C' makes only 1 comment throughout the observation, asking the adult for help as the screen of the i-Pad becomes locked and the child seeks support for it to be unlocked. Child 'C' then moves away from the group to independently use the device whilst sat on his own. Child 'J' is also identified within observation 2 as making only 6 comments throughout his time

accessing the i-pad, and limits his interactions with his peers through a dismissive display of body language. These behaviours displayed whilst accessing the devices also support the social interactionist theory of language development, suggesting a lack of social interactions and communications with others could cause delays in the development of language. The lack of social interactions identified within the observations would suggest this is how the children access the devices within their HLE, suggesting the use of such devices are not being positively role modelled by adults and little social communication takes place whilst children or parents are engaged with technology.

Goldstein (2013) and Levin (2013) appreciate the advancements in technology are changing the way in which children play, which is supported within the data collected through the parental questionnaires (Appendix 38), as participants identify a range of applications their children are given access to whilst using hand held devices (Figure 3), including both educational and non-educational games.

Figure 3: Results of parental questionnaire, question 7.



Within the focus group transcript (Appendix 33), children describe using devices within their HLE without the support from parents (Figure 4), which correlates with the data gathered within question 6 of the parental questionnaires (appendix 38) identifying 16 of the 20 children being given independent access to electronic devices whilst at home. The independent use of devices could therefore suggest a

reduction of social communications within the home whilst children are engaged with the technology.

Figure 4: Children's communications within the child focus group.

H	I go on my tablet on my own… a long time, mum says I can	Smiles
R	No…I do it on me own	
T	I do too…but sometimes I can't so S shows me	

Mobile devices are able to offer interactive experiences for children which are able to encourage and develop speech, language and communication skills, when supported appropriately through adult supervision and interaction, as suggested by Siraj-Blatchford and Whitebread (2005); Sweeney (2011) and Carlyle (2016). However the lack of positive modelling by adults of how technologies should be used in an interactive way is resulting in a reduction of face to face interactions taking place, and spoken communications within the HLE becoming fewer as children themselves start to become increasingly involved with technologies, results of which are identified within the transcript of field notes: observations 1 and 2 (Appendices 34 and 35), as limited verbal communications are recorded from children engaged in independent use of the i-Pad.

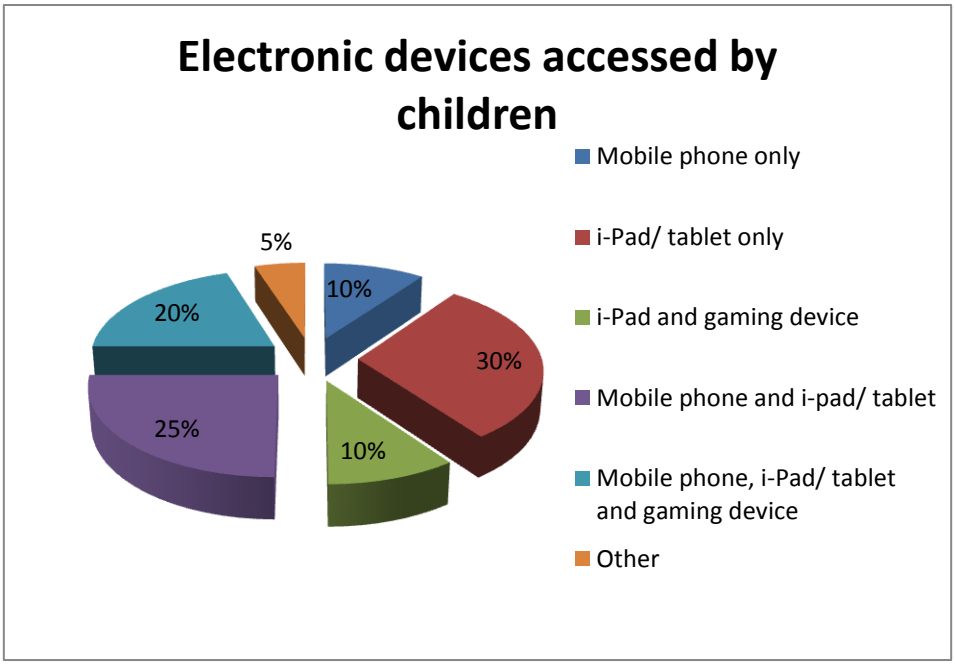
2.2 Devices accessed by children

It is clear from the data collected that all adult participants allow their children access to hand held electronic devices within the HLE, as question 2 of the parental questionnaire collects information regarding the specific devices children access (Appendix 38).

It is clearly identified that children of participants are given the opportunity to access a range of devices within the HLE, which are used in a number of combinations. It is

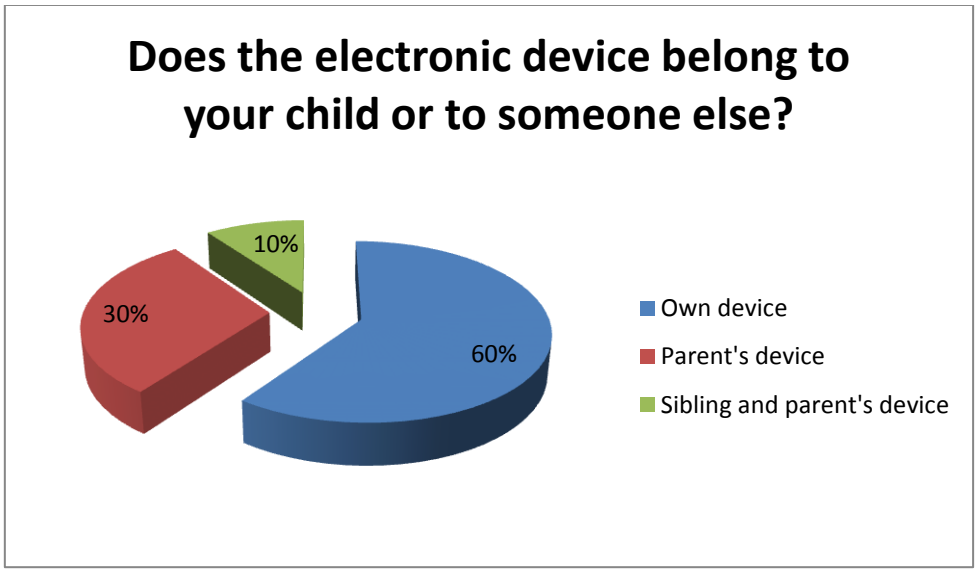
identified that 19 of the 20 participants allow their children access to mobile phones and i-Pad/ tablet devices (Appendix 38), whilst figure 5 demonstrates the combination of devices children are given access to within the HLE.

Figure 5: Results of parental questionnaire, question 2.



Within the questionnaire's parents reveal that 12 of the 20 children discussed have access to their own hand held electronic device, amounting to 60% of the 3 and 4 year old sample children having their own personal device (Figure 6). Data generated from question 3 of the questionnaires also highlight that 11 of the 12 children identified as having their own electronic device, have their own mobile phone or i-Pad/ tablet device which they access within their HLE (Appendix 38).

Figure 6: Results of parental questionnaire, question 3.



These findings are supported within the transcript from the Child focus group discussion, as all 4 of the children involved in the discussion confirm their use of i-Pad/ tablet devices within their HLE (Figure 7), and 2 of the 4 participants are acknowledged as having their own personal i-Pad/ tablet devices which they use at home (Appendix 33).

Figure 7 Children's communications within the child focus group.

R	Sometimes but not all the time, so mummy gives me hers	Smiles at staff
T	I got a i-Pad at home	
E	Me and M have a go on mummy's i-Pad at home, but we aren't allowed it very long	Raises eyebrows
H	I go on my tablet on my own… a long time, mum says I can	Smiles

Children are observed using the i-Pads confidently within the transcripts of field notes: observations 1- 4 (Appendices 34- 37), with little assistance needed from the adult or from that of their peers, indicating the children observed are familiar with such devices and are provided with similar technologies within their home learning environment. This supports O'Sullivan's [n.d.] suggestion that there is an increase of hand held devices being purchased solely for the use of children.

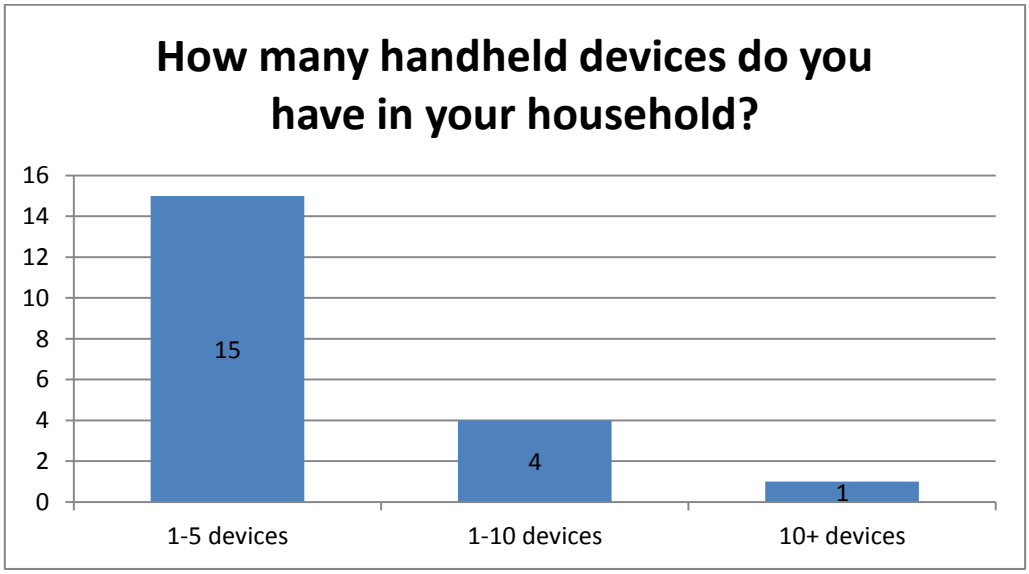
Within the child focus group child 'H' reveals he and his 4 siblings have their own tablet devices at home, and all four of them are able to use their devices independently (Figure 8).

Figure 8: Communications between adult and child within the child focus group.

Staff	Do you share your tablet with your brothers?	
H	No, cos J, C, C and J have got one too and they go on theirs by they own	

An increased use of technology within homes is also supported through the data collected in question 8 of the questionnaires (Appendix 38) in which all participants record having 5 or more devices within their homes (Figure 9). Findings from the focus group and parental questionnaires correlate with suggestions of Palfrey and Gasser (2008) in which families are experiencing a reduction of social interactions within the home due to an increased use of technology. This reduction in social interaction also gives reason to believe children are lacking in the two- way interaction needed to support early speech, language and communication development resulting in the increased number of children being identified with difficulties.

Figure 9: Results of parental questionnaire, question 8.

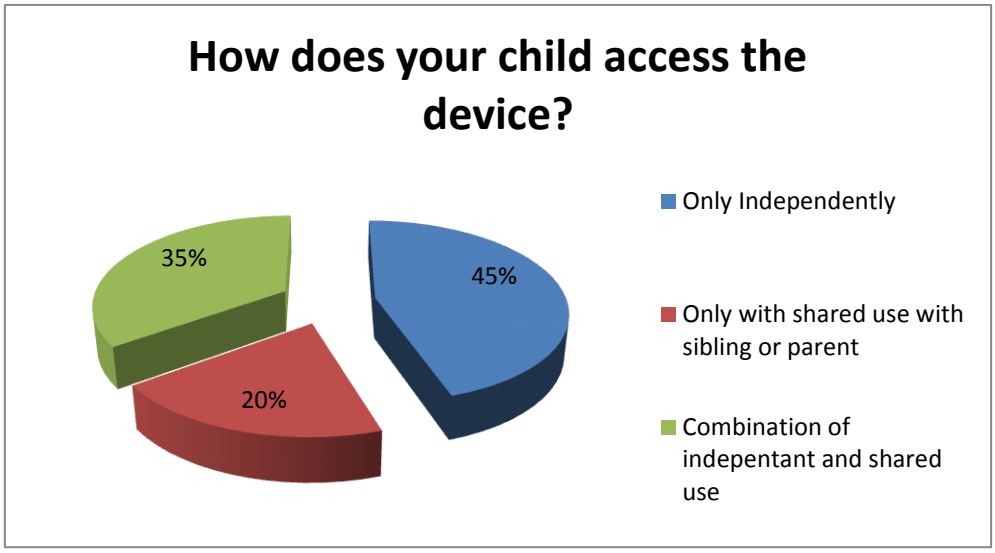


2.3 How devices are accessed within the home learning environment

Locke *et al,* (2002) and Law *et al,* (2011) believe there to be a strong link between the increase of children identified with speech, language and communication difficulties and children living in areas of deprivation, which is supported by the research of Marmot (2010); Field (2010); Allen (2011) and Tickell (2011). However data generated from the parental questionnaires suggest an increase in difficulties may also be linked to a lack of adult and child interactions within the home due to the increased use of technology. It is identified that 45% of the children associated with the questionnaires access hand held electronic devices independently within the HLE with no help or interaction from parents or siblings, and a further 35% of children access devices independently with some interaction from parents or siblings, leaving only 20% of the 3 and 4 year old children involved in the data collection having shared interactions with parents or siblings whilst engaging with the technologies within their homes (Figure 10). Within the child focus group discussion 3 of the 4 children involved also reveal they are able to access i-Pad or tablet

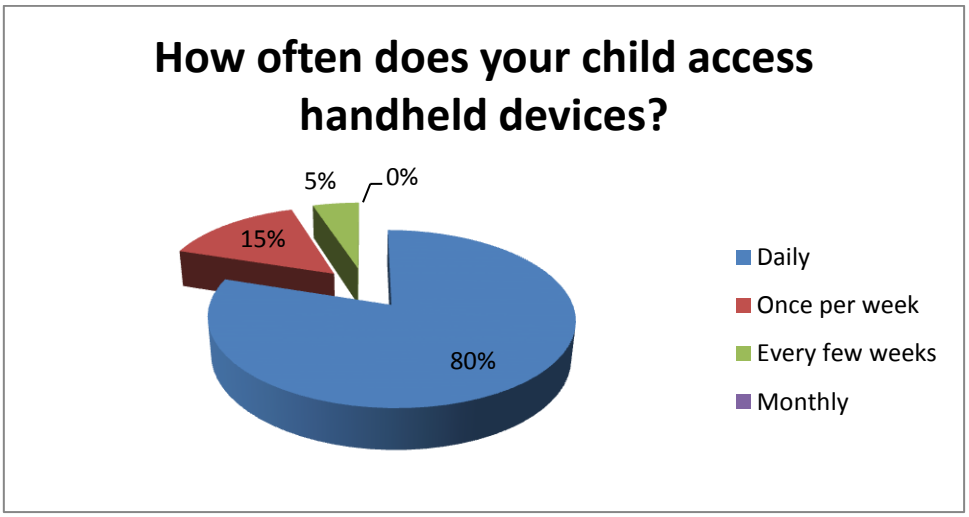
devices independently within their HLE (Appendix 33), which would suggest a lack of communications or interactions with others whilst accessing the device.

Figure 10: Results of parental questionnaire, question 6.



The Office of National Statistics (2014) identify an increase of internet usage within households, although only 3 participants of the questionnaires indicate their child accesses the internet using hand held devices within the home (Appendices 5, 7, 20), which could suggest the increase of internet usage to be from adults. However data generated from the parental questionnaires (appendix 38) identify 80% of children discussed to be given access to hand held electronic devices on a daily basis, and another 15% accessing devices once per week (Figure 11). This data displays a significant increase to Formby's (2014) suggestion that 28% of 3 and 4 year olds access touchscreen devices on a daily basis, suggesting hand held devices are continuing to become increasingly popular forms of entertainment for children within the HLE.

Figure 11: Results of parental questionnaire, question 4.



Data produced from the questionnaires identify 16 of the 20 children discussed being given independent use of hand held devices within the HLE, with 9 of those 16 children having no support or interaction from an adult or sibling whist accessing the device (Appendix 38), this supports suggestions around parental attitudes towards the appropriate use of technology by Roxby (2013); Firestone (2014) and Hunt (2015).

The information collected through the questionnaires identifies 14 of the 20 children are given access to hand held devices on a daily basis, of which 11 of these children have their own device and the other 3 children use a parent or siblings device (Appendix 38). Data collected also shows that 7 of the children identified as using the devices independently are limited to 1-2 hours play time on the devices per day, and 5 children are allowed between 2 and 4 hours per day (Appendix 38). However participant 4 (Appendix 5) allows the child to access the hand held device 3+ hours per day, although this does include interaction with parent and sibling whilst accessing video or films, which may suggest films are watched together throughout the day. Participant 3 (Appendix 5) however, specifies their child is given unlimited access to hand held devices, accessing video or films and the internet independently with no interaction from a parent or sibling, suggesting a lack of appropriate language modelling and positive interactions taking place between adults and the

child within the HLE. However findings from the questionnaires related to the amount of time children spend accessing devices within the HLE do not support that of Palfrey and Gasser (2008); American Academy of Pediatrics (2015) and Carlyle (2016) who suggest children are exposed to an average of 7 hours per day of entertainment media, although these suggestions do also include televisions and computers which were not included within the study carried out by the researcher, and therefore could increase the average exposure time if also considered.

Bruner's (1983) LASS theory collaborates with the potential affect an increased use of technology within the HLE may have on children's early speech, language and communication development. As identified within the questionnaire data (Appendix 38) and the transcript of the child focus group (Appendix 33), children are being provided with an increase of opportunities to access hand held devices and are becoming ever more competent to access these devices independently. Children's increased use of devices, along with parental daily use of technology, combined with a decrease of social interactions within the home may be a significant factor to the increased number of identified difficulties within children's speech, language and communication, which supports Palfrey and Grasser (2008); American Academy of Pediatrics (2015) and Carlyle (2016).

Within the transcripts of the field notes: observations 1- 4 (Appendices 34- 37) each child observed is able to use the i-Pad independently, requiring little support from the adult or their peers. On only 3 occasions are staff asked to provide support (observations 2 and 3, Appendix 35 and 36), which is due to the screens of the i-Pads being locked and the children being unable to unlock them independently, and also children requesting the i-Pad to be removed from the case to enable them to take photographs easily. The lack of support needed by children when using hand held devices is also supported within the transcript of the child focus group (Appendix 33) as 3 of the 4 children discuss accessing devices independently, and evidence can also be identified within the data generated from the parental questionnaires (appendix 38), as participants identify 9 children being capable of using the devices without any support from parent or sibling. The lack of support required by the children within the observations does however support the presence of Vygotsky's zone of proximal development theory (1962), suggesting the children's independent skills in using the devices could have been encouraged through a

scaffolding process between the child and an adult or older sibling at an earlier point within the HLE, however this was not examined within the study.

Chapter 3 Conclusion and Recommendations

3.1 Conclusion

It is evident from the literature reviewed and the data collected from the research methods that the use of technologies within the HLE is increasing, resulting in children being presented with electronic devices as a form of entertainment from a very young age. However it is identified that children are not being given a suitable amount of supervision or support whilst using the technologies within the HLE, resulting in a lack of social interactions taking place between the child and an adult. Without conversational exchanges taking place within the home, through social interactions between the adult and child, children are becoming increasingly disadvantaged within the context of speech, language and communication development. Data collected through the research methods identifies a significant number of children being given access to electronic devices without support or guidance from an adult, which would suggest there to be a decrease of social interactions taking place between children and adults within the home. The lack of positive communication exchanges is having a significant impact on the development of social skills along with language skills, resulting in an increased number of children being identified with speech, language and communication difficulties when entering school.

Parental encouragement or limitation of hand held devices within the HLE is an influencing factor to the development of children's early speech, language and communication development. Connections between the use of hand held devices and a lack of communication or social interactions between the children have been identified throughout the observations recorded within the childcare setting, which strongly suggest a lack of positive role modelling to be taking place regarding the use of technology whilst both parent and children access such devices within the HLE.

These findings suggest a lack of parental knowledge towards the damaging effects an increased use of technology within the home may be having on the development of their children's early speech, language and communication development. Parents also appear to be unaware of the value of social interactions with their child and the importance of providing a rich HLE in which their child can experience and exchange positive communications with adults and other children. Parental attitudes towards the use of technology within the HLE has proved to be a major factor within the research, as parents appear to be dismissive towards the impacts of using devices around their children as well as allowing their children excessive use of the technologies. As suggested within the literature researched the use of technology is becoming a way of life within the 21st Century and being increasingly utilised within both the home and school learning environments, therefore children need be shown how to positively interact with devices to enhance their learning and development. It is vital that adults educate children from an early age of the appropriate ways to interact with devices, to enable positive interaction and ensure advancements in ICT will facilitate future learning opportunities.

Through the data collected it is evident that a significant number of children are given access to devices which may be inappropriate for the developmental stages of 3 and 4 year olds, such as mobile phones and i-Pads. Although the data collected does not identify what specific applications are accessed by children on either of these devices. However the high number of children identified as having access to their own personal devices which include mobile phones and i-Pads also causes concern in relation to the limited amount of social interactions which are taking place within the home on a daily basis.

Through the findings of the data collected it is identifiable that children are becoming increasingly confident in accessing technology independently, and are able to achieve personal goals when playing with interactive devices. As children become confident to use devices independently the need for adult support decreases, therefore resulting in in a reduction of meaningful scaffolding support and interaction between adult and child. However it remains the responsibility of parents to educate children with appropriate use of hand held devices; ensuring appropriate learning experiences are achieved from technology, incorporating suitable use of devices into

a rich HLE, which supports the development of children's early speech, language and communication.

3.2 Recommendations

The following recommendations were presented for future studies:

- Identification of the types of devices and applications parents use with in the HLE.
- Identification of the ages of siblings using technology with the cohort of children studied.
- Identification of the applications used by the children within the HLE.
- Parental views of child limitations of technology access.

The following recommendations were presented for the reinforcement of parental awareness:

- Introduction of parental awareness programmes regarding the appropriate use of technologies, which could be incorporated into antenatal classes and developmental reviews carried out with professionals.
- Government production of guidelines for the appropriate use of technology within the HLE.

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