

SHARED INTELLIGENCE

CHILDREN'S DIGITAL NEEDS AND LIBRARIES

A REPORT TO ASCEL



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1. Introduction

- 1.1 In April 2014 ASCEL commissioned Shared Intelligence to carry out a high level review of:
- how children are using digital technology for learning – and what is the evidence on effectiveness;
 - how libraries, museums and other organisations are already using digital technology to facilitate learning;
 - how digital technology for children’s learning is changing and what might be expected over the next five to ten years;
 - how libraries might support new digital trends to aide children’s learning through libraries.
- 1.2 The focus of this research was on young children of pre-school and primary age. For practical purposes we interpreted this as three to eleven year olds, though in the desk research we use examples of older children using technology to illuminate issues of relevance to younger children. Where possible we distinguish between younger and older children within the age group.
- 1.3 Our research involved the following activities:
- New qualitative research using focus groups which were designed by Shared Intelligence and carried out nationally by ASCEL members, to understand how children in the target age groups use digital technology as part of reading for pleasure, learning and creativity.
 - Desk research, which also drew on a literature review conducted in early 2014 by ASCEL, to bring together existing research into *wider digital trends* and research *specifically about* learning among children of primary and pre-school age.
 - Gathering selected case studies of current practice in libraries and similar organisations in terms of digital activities aimed at children.
 - Analysis and recommendations about the role libraries should play now and in the future including ideas for specific action.

2. ASCEL's Summer 2014 focus groups

- 2.1 The focus groups for this research took place in Summer 2014 and were an exciting collaborative exercise between Shared Intelligence and ASCEL members in each participating authority. Seven authorities took part, each having responded to the request for help from the ASCEL national committee. They were Bexley/Bromley, Essex, Gateshead, Hull, Kingston, Lancashire, and Staffordshire.
- 2.2 There were 25 focus groups in all. Each focus group was carried out by two library staff (in one authority Shared Intelligence staff also took part) and they reached a total of 199 children in libraries and schools across the seven authorities. In addition, a number of parents (or teachers) also took part in the discussions. For the under 5s focus groups most of the recorded discussion was from parents. The total coverage of the focus groups was as follows:
- Under 5s (72 children total, in 3 authorities)
 - 5s – 7s (54 children total, in 4 authorities)
 - 7s – 11s (73 children total, in 4 authorities)
- 2.3 The topic guide was designed jointly between Shared Intelligence and ASCEL colleagues and used across all the focus groups. Shared Intelligence also produced a set of instructions for the library staff running the focus groups, and a data capture template.
- 2.4 In addition to reporting on the focus group discussions themselves, the staff who led the focus groups were also asked to reflect on the process itself. The strong view across all those involved was that the focus groups were very useful as a structured method for obtaining insight into issues which are changing rapidly, and for understanding users generally. One told us *"I found the process very interesting in the respect of just how much 'technology' is being used out there. This was especially surprising with the under-five groups"*.
- 2.5 Some of those involved also said they intend to continue this type of qualitative research on a regular basis especially given it required relatively few resources. One library staff member described the process as *"simple to do... fun, informative and really brought out some things we didn't already know"*.
- 2.6 Another saw the data having value for their own change programme reflecting that *"it was very worthwhile finding out about how children use technology, especially at the moment for us as we are working through our Library Transformation programme"*.

Summary of focus groups findings grouped by age-group

- 2.7 In the following sections we summarise the responses by age-group which is where the most useful patterns can be seen (as opposed to grouping by location).

Under fives

- 72 children (plus their parents and carers)
- Eight discussions in 3 authorities

- 2.8 Our focus groups with under fives painted a picture of today's pre-schoolers having digital technology within easy reach almost from birth. That said, most are not immersed in technology. Waking hours are still spent playing with physical toys, drawing and colouring (on paper or on household objects), going to the park, or following a story read aloud from a printed book. With the exception of TV and DVDs it is the moments in-between which might be spent playing a game on a tablet, asking to look at a smartphone, waving to grandma on Skype, or copying a parent scanning groceries at the self-checkout.

- 2.9 Nevertheless, parents are anxious about too much technology in their children's lives, and try (with varying success) to limit their children's exposure to technology at least until they are a bit older.

- 2.10 By the time they are walking and talking pre-school children have already handled almost every kind of digital technology in the home; from digital toys such as child-specific laptops and cameras, to entertainment devices such as games consoles, the TV, and MP3 players, to touchscreen tablets and phones. Outside the home pre-school children are watching DVDs in the car, holding grocery items against self-service scanners, and encountering electronic whiteboards at nursery. We heard of one or two even using library self-issue machines.

- 2.11 The very youngest children (under 3s) simply like playing with *"anything with buttons"* and enjoying the sounds and visual excitement of gadgets regardless of whether they can use them.

"My little boy loves playing with the keyboard and mouse – he can't do it properly but loves copying what his Dad does."

- 2.12 Often they mimic or copy those around them. But as they get nearer school age copying becomes more social; wanting to take photos or view photos on a smart phone and then talk about them or even using photos to talk about their day at bedtime. On-demand television, film and video clips (such as nursery rhyme videos), are a boon to parents and are loved by pre-schoolers; watched on tablets, smartphones, and smart TVs.

- 2.13 We didn't come across as many pre-school children using computer games consoles. But we did hear of pre-schoolers playing games and puzzles on phones and tablets – a few of which might be educational (spelling, phonics) or creative (drawing, making music, altering photos). Pre-school children also seem to love maps on smartphones *"to find Daddy's workplace"* for example. They also enjoy joining-in with parents on video-calls to other family members often using Skype or FaceTime.

- 2.14 One parent suggested her daughter *“prefers more interactive things than TV programmes – loves taking photos and get really excited when she can see them and show them to everybody”*.
- 2.15 Only occasionally did we hear of pre-school children using digital technology to read books, or to have e-books read to them. One parent mentioned her child used a story-book app on which the child could turn pages by swiping the touchscreen.
- 2.16 Our focus groups highlight many examples of digital technology being one of the ways that very young children can copy, mimic, and join-in with what older siblings or adults are doing. For the very youngest this might simply mean wanting to touch or hold the phone/remote control/laptop. But for slightly older toddlers it might mean taking a photo, or joining in a video-call. It might also mean singing along to a film or television show, or wanting to make the thing just demonstrated on a crafting video; one parent has seen her son *“role playing on the phone asking Fireman Sam for help”*.
- 2.17 Alongside enthusiasm about technology there was also a clear undercurrent of concern from parents about pre-school children using digital devices too much. But at the same time we heard an almost universal view that children *“love it”* and become *“very focused”* or *“transfixed”*. There were also worries that it is often for the parents’ convenience or to pacify a child that they are encouraged to play with a phone or tablet.
- 2.18 In one discussion a mother explained that her three year old had taught her how to take photos using the iPad. Clearly the sense some parents have that their children are more technically adept than they are is part of the concern they feel.
- 2.19 These mixed feelings are in some respects no different from the long-experienced worries of tired and stressed parents about using the television as a babysitter while they hang the washing out or try desperately to call the bank.
- 2.20 A far more straightforward area of concern is around the risks of children encountering unsuitable web-content. This was about internet access specifically; much less risk is seen to exist around using DVD players, cameras, or even touchscreen devices *per se* if internet connectivity has been disabled. Following on from this, it was the risks associated with internet access in particular which seemed the main factor in determining levels of parental supervision or desire to use a device together.
- 2.21 So the impression we get is of children using digital technology for play, discovering the world, and sometimes for creating and making pictures, photos and music, but digital technology does not reach into every hour of the day and parents are trying to keep it that way.

Five to seven years olds

- 54 children (plus their parents, carers and teachers)
- Eight discussions in 4 authorities (two discussions in schools)

- 2.22 Our discussions found use of digital technology among this transitional group of children to have similarities to both under 5s, and the older group of 7-11s.
- 2.23 As with all the age groups, almost every type of technology was mentioned; PCs, smart phones (belonging to parents), tablets, games consoles (full size and handhelds), DVD players (for long journeys), e-book readers, and of course TV.
- 2.24 As for when and where, we heard digital technology being used in school, after school, on their own, with friends (to watch films). But we did not get the same sense of technology being used 'everywhere' yet, in contrast to the older 7-11 group.
- 2.25 What they had in common with under 5s was that children at this age still tended not to have their own devices (although some did), but they regularly used their parents' on which some still enjoyed copying an adult's actions "*I help my dad move it [text on a Kindle]*". Some seemed to have access to a tablet which was considered as 'theirs'. Some reflected on what devices they would like to have and what they would do if they got one.

"I don't have my own iPad, I would play my own games and watch my own films".

- 2.26 One child did colouring-in with templates a parent had found online and printed – probably as they had done before they started school. But another child was using a 'paint' type app to draw pictures on a touchscreen device. The BBC's pre-school channel CBeebies was still popular for this age (including on-demand access to CBeebies via iPlayer). In fact all forms of film and TV were popular including Netflix on-demand, and YouTube "*for Frozen, songs and fun things*", or for "*Barbie movies on YouTube as I don't have them on DVD*".

Some activities in common with the older group also began to crop up. One child said "*my sister helps me with my homework [using a computer]*", another "*made a PowerPoint about sharks*" – it was unclear if this was for school or not. In one group a child talked about using email. More sophisticated games, Minecraft in particular got mentioned often, as did maths games and one parent said their child played a game which "*had been recommended by the school*". Educational software developer <http://www.educationcity.com/> was also mentioned as being used by this age group. One child had read e-books and there were mentions of the Summer Reading Challenge website too.

- 2.27 We also heard hints of the family choices this age group might encounter over the use of technology, not least the cost.

"I'm getting a computer soon, when we get some money" said one child.

- 2.28 Reactions were the same as for the other two age groups; "happy", "frustrated", "competitive", "enjoy winning". Generally parents had concerns similar to the parents of under 5s; "*makes my children moody*". One parent was concerned that "children don't know how long they spent on games".

- 2.29 So the overall impression we get from this age group is as one might expect, that interaction with technology in the first years at school is bound up in the transition from the early childhood world of play and curiosity, unstructured days, and never straying far from parents or carers - to the world of school, structured learning, making friendships independently, and taking more responsibility.

Seven to eleven year olds

- 73 children (plus their parents, carers and teachers)
 - Ten discussion in 4 authorities (two discussions in schools)
- 2.30 Children in this age group, basically those in junior school, are using digital technology in all aspects of their lives. That means in school, after school for homework or to explore their interests and "learn facts", for play either alone or with others, to listen to music, and of course to communicate by voice, text and video.
- 2.31 We heard about technology being used for creative purposes, for example making videos rather than just watching them. One focus group participant talked about using digital devices to discover recipes in order to learn how to cook, it had become a game with their parents to Google a recipe and then find all the ingredients.
- 2.32 Another liked taking their tablet outdoors *"to test connectivity"*. One child in the group talked about using a Quran app to learn how to pray.
- 2.33 The devices they are using are a mix of PCs or games console belonging other family members, as well as things they see as their own, especially tablets or smartphones. Some devices were clearly seen as one person's property (*"I take my iPad everywhere"*), while some things were seen as shared property among family members.
- 2.34 This was also the age group where reading e-books started to come across strongly *"I prefer the Kindle to a real book because I read a lot and can store lots of books. I also like that it tells you the per-cent of story read... I use the Kindle on my own"*. Although some consciously choose paper books *"I prefer books... holding it in my hands"*.
- 2.35 When we asked this age group where they tend to use digital devices the common response was in school, outdoors, indoors, in their bedroom, in the front room, in the car; in other words *"everywhere"*.
- 2.36 By this age homework has become a bigger part of life *"our homework is set by our school on the computer. We can access it from home through Learning Pad"*. Children this age are also using technology for their own learning and exploration.
- "we use Mathletics at home on the computer"*
- "...research for homework but also sometimes I want to research on the internet something a friend has told me about, could be anything"*.
- 2.37 Some children by this age were beginning to understand there are rules around plagiarism.

"we're not allowed to cut and paste stuff from the internet for homework."

- 2.38 We heard about social use of technology which was physical (in the front room using a games console with a friend) and virtual (playing against other online gamers). One respondent mentioned *"apps you can use to meet people"* (we didn't record whether they meant a child-specific app or something intended for older ages). Another child used their Xbox games console to talk to friends in other parts of the UK *"we challenge each other to games"*.
- 2.39 As with the younger children their personal reaction was that it made them feel "happy" and "excited", and often led to a moment of achievement or satisfaction *"like when you find a diamond in Minecraft"*.
- 2.40 One parent of a child with autism reported that their child *"did nearly all his learning on the computer"*.
- 2.41 Summer Reading Challenge also got a mention – one child had enjoyed using the Book Sorter feature.
- 2.42 There was an expectation too that as they grow up they will be allowed to use a wider range of devices and content. One said they hoped Instagram might be the *"next thing"* they would be allowed to use; a step up which required parental permission.
- 2.43 We also heard about their growing financial independence *"if you've bought it [Xbox] with your own money that makes you feel good"*.
- 2.44 Awareness of the need for moderation also showed among this age group, *"I don't game too much in the evening... probably read a book before bed"*. Or *"I took my iPad on the journey to Cornwall. I don't want it when I'm there because there's the beach and everything"*.
- 2.45 This self-awareness from some mirrored parents' desires for restraint *"we seem to have everything!"* and *"it's too much money to have all the consoles"*. That said, one child lamented *"I just got banned [from using the tablet]"* which they saw as the most terrible punishment imaginable.
- 2.46 As with the younger age group, parental monitoring was driven more by concerns over harmful content than any other reason (such as wanting to do an activity together). The issues of online safety seemed to stem not just from children's increasing levels of online activity, but also sessions held by schools for parents which was described by one parent as *"a big push"*.
- 2.47 So this is the age-group who will soon become the next generation of teenagers. For them technology is everywhere and they can use almost all of it. But just as in their offline world - they do not yet understand everything they come across, or indeed the risks. One comment probably sums this age group up best. When we explained that we were doing this research, one boy replied (perhaps half joking) *"why didn't you just look all that up on the internet"*.

3. Wider digital trends affecting children's learning and creativity

- 3.1 In a recent related study for the Society of Chief Librarians (SCL)¹, Shared Intelligence explored a number of digital trends of relevance to library services and the implications of these trends for library leaders. Much of the trends analysis in that document is directly relevant to understanding how children's use of digital technology for learning and creativity might change in the future.
- 3.2 Therefore it is worth highlighting key observations from the previous study. The most important finding from that study is that the pace and scale of change in the digital sector is significant, even over a timespan of five to ten years. One salient example is that the first iPhone was released in 2007 and yet in seven years this one product has had a globally transformative effect on the accessibility of computing and the range of applications available to individuals. Another is the development of driverless cars from unreliable prototypes crashing in the Mojave desert just ten years ago in 2004, to licensed vehicles operating on public roads in several US states today. This fast pace of change is likely to continue or even increase over the next five to ten years.
- 3.3 However, adoption of and access to technology is incredibly varied which creates many kinds of 'hot' and 'cold' spots, be that availability of broadband, adoption in different economic sectors, or access by different social groups. For example the pace of change in applications, internet access and access to digital devices seen in the home is not seen uniformly in public institutions, including schools and nurseries, as well as in health and social care. Whilst digital technology and innovation is being adopted and successfully used in some contexts, the institutional barriers mean that adoption is slower than in many private households. The challenges faced by library services in introducing public wi-fi and broadband again show the difficulties faced by public organisations trying to stay abreast of changing digital demands and capabilities.
- 3.4 Therefore, whilst a dramatic change in digital technology is happening all around us, the extent to which this filters through to how digital technology is used by children in schools and other public settings will vary dramatically in practice.

Trends relevant to children

- 3.5 Other specific trends which were observed and relevant to a consideration of children's needs include:

¹ Shared Intelligence (2014) Horizon Scanning Report to the Society of Chief Librarians – July 2014

- Broadband speeds, including mobile broadband will continue to increase. However, large gaps in performance between areas are likely to persist with greater performance within urban areas. For all users, including children, this will make it easier to stream certain material and will make bandwidth-intensive forms of communication such as video communication easier.
- The internet will become increasingly ubiquitous over the next five to ten years. Notions of 'going online' will be replaced by the experience of being constantly connected through multiple devices at once rather than simply through a PC, tablet or phone. For many it will be via their smartphones that they experience this shift, but also via the proliferation of internet-connected equipment and 'things' from wrist-watches, to domestic energy controllers, to televisions, to personal health devices.
- Advances in software will enable automation of increasingly complex tasks from real-time voice translation to driving a vehicle. For children as well as adults this could be empowering for those children who are taught how to interact with such systems skilfully and positively.
- New types of creative digital hardware are already creating new possibilities for design and creation. As above, specialist devices such as 3D printers but also ubiquitous devices especially touchscreens, are opening up new possibilities for children to be creative.
- There will be a continued shift from paper-printed text to screen-text which is already much further advanced in educational and academic literature than in consumer literature. While the former will not disappear, the proliferation of e-readers, text-to-audio, smartphones and tablets will help e-books displace printed material. Text-to-audio and scalable fonts can completely transform the reading experience of children who struggle with reading from text on paper.
- As screen-text overtakes printed text, text itself is being overtaken by video which will continue to increase in importance as a means of communication, again supported by improvements to internet connections and growth in the numbers of internet-accessible devices.
- Increasing affordability, sophistication, and portability of technology will enable many of us to create and distribute things which until recently would have required substantial resources and expertise - our own music, film, radio, computers, robots even spacecraft.

3.6 Children will be affected by all of these changes. In particular, the decreasing cost and accessibility of digital devices (relative to processing power) – notably in smartphones and tablets – will open up significant new horizons for children. Three-quarters of UK children already have access to a touchscreen device² which typically means they can: take and edit pictures, create short films, record and remix music, code simple programmes, and share and publish all of the above. Likewise, children can already access huge volumes of educational material on effectively any subject.

² National Literacy Trust (2014) Parent perspectives: Children's use of technology in the Early Years – pg. v

- 3.7 However, despite falling costs of equipment, and of data connections (relative to data speed) 11 million Britons are not online. Although researchers at the Tinder Foundation forecast this figure will fall over the coming five years to around 6 million, they also predict that those left offline will not simply be the elderly, but rather low income families, the unemployed, and people with disabilities and long-term illness. It is very likely therefore that even as technology becomes more affordable the poorest households will still find either the equipment or the data connections, beyond their financial reach.³ In many cases this will be exacerbated by the fact that individuals with poor credit history are routinely required to pay significantly more for mobile phones, data services, and household technology than those with good credit history.
- 3.8 Over the next five to ten years the barriers to using these and similar technologies will decrease, and the range of technologies that will be available to children will increase. The exact nature of new opportunities is difficult to speculate on, but essentially all areas of learning or creativity which involves digital technology will likely be more accessible. Some examples of potential activities which may become significantly more accessible to children in the next five to ten years include:
- Creating and distributing their own audio and visual content.
 - Writing computer games / app development.
 - 3D object design and fabrication.
 - Everyday access and use of robotics technology.
- 3.9 What is clear, however, is that children and parents are already faced with a huge choice of digital applications. There are already over a million applications for both Android and Apple touchscreen devices⁴. For parents in particular this brings dilemmas about what to choose and what to avoid, as much as opportunities and ease of access.
- 3.10 Therefore one of the key obstacles to enabling children to benefit from digital information and knowledge is the need to help both children and parents to better understand the opportunities arising from digital technologies. This presents a significant opportunity for the library service to help children and their parents get the most out of digital knowledge by signposting and promoting applications and opportunities to use digital technology in ways which promote learning and creativity.

Trends relevant to education

- 3.11 Digital learning and educational technologies will mature significantly over the next five to ten years, due to increases in computing power, improvements in machine learning and A.I. (artificial intelligence), and improved voice-recognition. At present, progress in educational

³ According to OFCOM average household spend on fixed broadband is currently £16 a month plus another £15 on mobile phones *Cost and value of communications services in the UK*, OFCOM (2014)

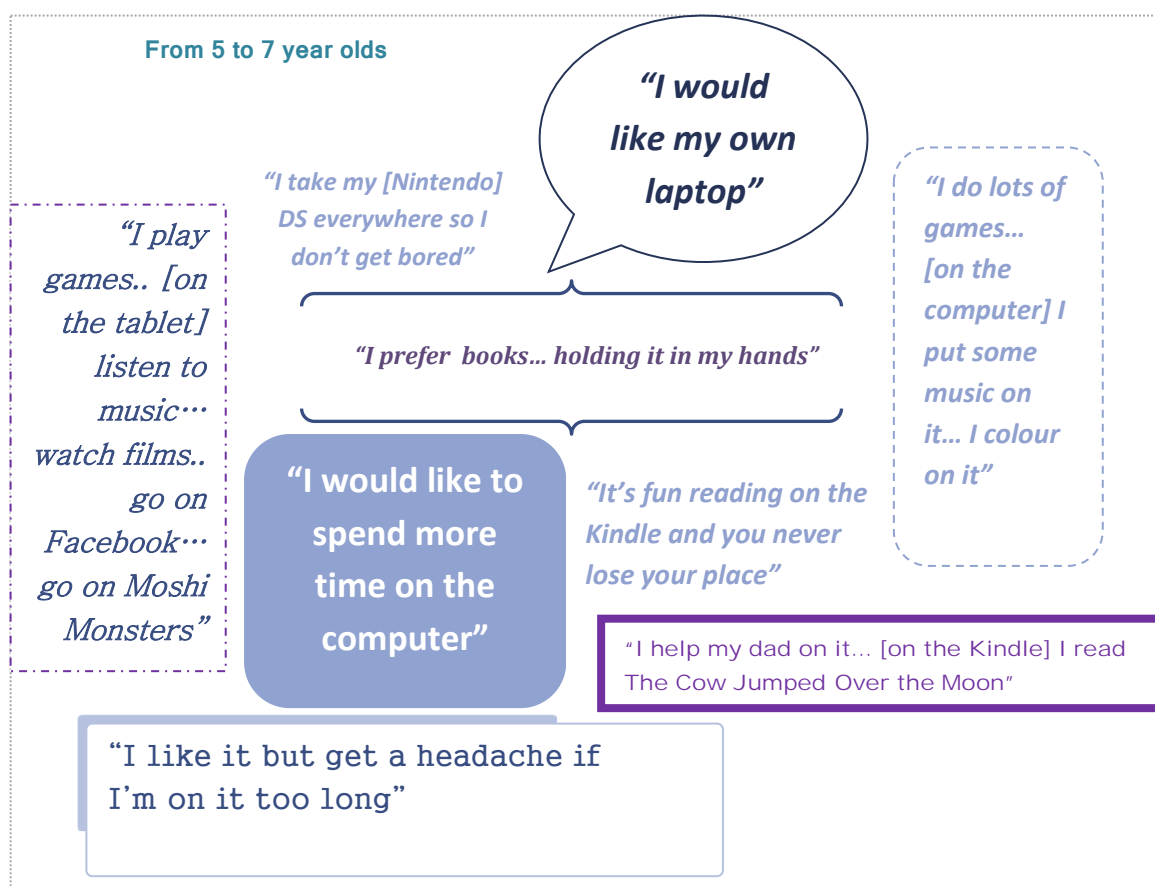
⁴ <http://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/>

software has been greatest in subjects like maths where computers can easily understand right and wrong answers. As computers become more powerful and language recognition becomes more sophisticated, it is likely that other subjects such as languages and the social sciences will benefit from improvements in educational software. Improvements in A.I. and voice recognition might also enable children to interact with 'virtual teachers', opening up the possibility for one-to-one tuition in many subject areas.

- 3.12 As children interact more with computers as part of their learning, this will open up opportunities for collecting more data on children's individual progress and learning. This will largely be positive as it will provide better indications of which educational methods are most effective and will allow for better personalisation of learning. However, it will also create privacy issues as well.
- 3.13 As technology becomes more pervasive, there will be particular challenges in considering the implications of different levels of exposure that children have to technology. Many parents already have significant concerns about the amount of 'screen time' or technology usage that children, especially younger children, experience. Over the next five to ten years it is likely that, at least in built up urban areas, the internet will be 'always on' for many people.
- 3.14 Likewise, use of computers will become more 'intimate' as screens move from 'something we keep in our pockets / bags' (i.e. smartphones / tablets), to 'something we wear' (e.g. Google Glass, Apple Watch, wearable cameras). The experience of using a computer may well change significantly due to virtual reality or augmented reality. Google has recently invested in a relatively unknown start-up called Magic Leap who are believed to be developing augmented reality technology. This follows on from Facebook's \$2bn investment in virtual reality company Oculus Rift in March 2014. Such technologies might provide more immersive learning experiences, but equally might bring negative effects if they reduce exposure to physical social situations or physical activity.
- 3.15 In terms of social inequality these technologies bring risks too. Even though these kinds of technologies may cost a small amount relative to their capabilities, purchase costs of such devices may still exceed for instance, the average weekly or even monthly wage; some types of information technologies may become more socio-economically divisive in ways that previous technologies (such as television, radio, mobile phones, and computers) did not. Some academics are beginning to use the term "information justice" to describe these and related challenges.
- 3.16 Within this context there will be a constant need to review what technology is appropriate for children and what is available or accessible to children of different backgrounds. Parents will also, of course, make their own choices. But if the library service is to become involved in supporting better access to digital technology it will need to better understand the potential benefits or risks of different technologies for children's development and the ways in which children in their community are able, or not, to access these.
- 3.17 In our original report for SCL we highlighted that there would continue to be a divide in access across income groups and this is also relevant when considering children's access to digital technology. There is already a digital divide between children in different income

groups and this will continue, so there will continue to be a need to support access to technology for children from lower income families. The library service already does play an important role through its provision of PCs, and could do more in the future.

- 3.18 Therefore whilst the next five to ten years will see significant improvements in access to new and improved digital technologies, the most important shifts that will determine the effectiveness of this technology will be cultural. Where children and parents are empowered to understand the learning and creative benefits of technology, the effects of these developments will be more profound. Where knowledge and understanding remains limited either by educational or financial barriers, the effects of new technology will continue to be limited, and children will continue to be exposed to risks associated with technology.



4. Desk review of children's use of digital technology for learning and creativity

- 4.1 This section reports on the desk review carried out by Shared Intelligence for this project to bring together existing research into wider digital trends and into learning among children of primary and pre-school age. It also includes evidence highlighted in a literature review by Amanda Taylor (ASCEL information consultant) conducted in July 2014.

Use of digital devices at home

- 4.2 Usage of digital devices amongst children is relatively high and increasing. 'A recent Ofcom survey found that tablet computer use by children aged five to 15 has increased three-fold between 2012 and 2013 and that over a quarter (28%) of children aged three to four years old use a tablet computer at home.⁵ A National Literacy Trust survey of parents found that nearly three-quarters (72.8%) of children had access to a touchscreen device at home⁶. This mirrors the rise in ownership amongst adults, with 61% of adults now owning a smartphone and 44% of adults owning a tablet computer⁷. The proportion of children aged 5-15 who own e-readers rose from 20% to 30% between 2012 and 2013⁸.
- 4.3 The high usage of these devices means that, compared with adults, children are more confident in their knowledge and understanding of new technologies, less likely to claim to be confused by new technologies, and are more likely to display enthusiasm about new technologies⁹. Recent research by Ofcom suggests that six year olds have the same understanding of communications technology as 45 year olds¹⁰.
- 4.4 However, it is also important to recognise that knowledge, understanding and confidence are determined by access to technologies, which in turn are related to socio-economic characteristics. These factors affect children as well as adults, and mean that children from higher income families are likely to be more confident when using digital technologies than those from lower income households.
- 4.5 There is some evidence that access to technology can be particularly beneficial for poorer children's reading, compared with the use of books alone. Research from the National Literacy Trust¹¹ seems to show that when children from low-income families are able to access digital technology, they derive more benefit than their better off peers (even though

⁵ National Literacy Trust (2014) Practitioner perspectives: Children's use of technology in the Early Years – pg. 2

⁶ National Literacy Trust (2014) Parent perspectives: Children's use of technology in the Early Years – pg. v

⁷ Ofcom (2014) The Communications Market Report – pg. 3

⁸ National Literacy Trust (2014) The Impact of eBooks on the Reading Motivation and Reading Skills of Children and Young People: a literature review – pg. 4

⁹ Ofcom (2014) The Communications Market Report – pg. 5

¹⁰ Ibid – pg. 35

¹¹ <http://www.literacytrust.org.uk/news/5963-technology-offers-a-route-into-reading-for-disadvantaged-three-to-five-year-olds>

their chances of accessing technology are lower). Those same lower socioeconomic status children are also more likely to have poorer communication skills and fewer books in their homes.

Creativity, and learning through challenges and games

- 4.6 Children are using a range of technology for learning and creativity. In many cases this is often the same technology that children use for other purposes. Smartphones / tablets / computers / television are used for education, learning and creativity but also used for more general entertainment. Of course, in some cases, the lines between entertainment and education / creativity are blurry. For example, the game Minecraft which is very popular among children of this age group is entertainment first and foremost. But it also involves a large amount of creativity and can have educational benefits helping children learn about weather, climate, geology, programming and building. This is especially the case when players get involved in 'modding' where they do not simply play the game, but modify and create new game elements themselves.
- 4.7 Most obviously, smartphones and tablets provide access to a large pool of educational and creative applications. The benefit of such applications is that they are mobile, relatively accessible and can reinforce learning from other settings. Challenges associated with these applications include restricting access to suitable material, privacy issues, and ensuring that the applications do not become a distraction. Whilst there are many dedicated educational / creative apps, it is also important to recognise that the core features of a smartphone / tablet - i.e. access to a microphone, camera, video recorder, and touchscreen interface - can also significantly support creativity as well. It is highly accessible but sophisticated technology such as this, that is enabling teenagers like Zoella to build online TV channels and vlogs from their bedrooms (which in Zoella's case led to her launching a 'real world' cosmetics company, and signing a Penguin book deal).
- 4.8 Gamification of learning using digital technologies is another important trend. The Summer Reading Challenge is a good example of this – although ultimately it is about participation and reading for pleasure, rather than to achieve specific learning outcomes. Other examples exist with closer links to formal education outcomes and greater integration of digital technology. A prominent example of this is the Khan Academy, a free collection of over 6,000 online videos and 100,000 'challenges'. Children can watch videos multiple times and complete challenges to earn 'badges' in subjects such as: mathematics, history, healthcare, medicine, finance, physics, chemistry, biology, astronomy, cosmology, economics, and computer science. Since 2006, the Khan Academy's videos have been watched nearly 500 million times¹². A large amount of this content is aimed at older children, but especially in the maths strands there are introductory videos which are suitable for younger children.
- 4.9 Another online platform is [Mathletics](#), an incredibly popular web-based competition which many UK schools subscribe to. It is a charged-for service which provides maths material

¹² <https://www.youtube.com/user/khanacademy/about>

linked to the national curriculum from ages five to eighteen. Mathletics allows individual children and classes of students to compete against each other on an international (or UK) basis at school or at home after school. Leaderboards of top 'mathletes' are updated in real time, giving a compelling and competitive aspect to learning mathematics. Children are helped to learn by animated support and through focussing exercises on areas where more help is needed. Parents (or teachers) receive weekly reports on time spent on the service and progress.

- 4.10 By giving children autonomy in what and when they learn, by providing a continuous measure of progress, and by providing learning in different and interesting ways, there is evidence that gamification techniques can improve learner motivation and attainment¹³.

Computational thinking and simple programming

- 4.11 As well as traditional academic subjects, apps and software can help teach children other skills. Scratch is a multimedia programming tool for children developed by MIT with over one million users¹⁴. Scratch enables children to remix animated videos and write their own computer games. The experience becomes as much about developing games as playing them. The simplified language used by Scratch makes it easy to grasp and helps teach basic programming and programming logic. Moreover, the Scratch website also helps children to collaborate on projects remotely (sometimes internationally), as well as providing space for comments and discussion.
- 4.12 The increasing use of Scratch in UK schools is closely related to the introduction in September 2014 of the new Computer Science national curriculum from Key Stage 1 onwards, which we discussed in detail in our report on digital leadership to SCL. The new curriculum attempts to shift the focus from teaching clerical tasks using consumer software, to achieve the kinds of learning outcomes which were common thirty years ago when the BBC B Microcomputer was introduced to schools - around computational thinking, principles of programming, and understanding the wider role of technology in society.
- 4.13 More broadly, access to online videos can help children learn other subjects and skills, such as: musical instruments, languages, hobby skills, and sports skills. Internet forums associated with these kinds of interests allow children to discuss what they are learning, ask questions and get feedback on their efforts.
- 4.14 Internet access also gives children more opportunities for self-publishing, blogging, and communicating with others. As well as using mainstream blogging services / tools, there are a number of specific blogging platforms for children and for educational settings. There are also a number of services which help children connect with peers in other countries, just as their parents may have had 'pen friends' in the past.

¹³ See for example: Hamari, J., Koivisto, J., and Sarsa, H. (2014). Does Gamification Work? – A Literature Review of Empirical Studies on gamification

¹⁴ Fields, D. et al. (2013) Understanding Collaborative Practices in the Scratch Online Community: Patterns of Participation among Youth Designers – pg. 1

- 4.15 In addition to new types of software, various digital hardware also offer scope for learning and opportunities for creativity. For young children, devices from companies such as Vtech offer an accessible way to use simple computers, cameras, tablets and e-readers. For older children LEGO produces a range of customisable robotics kits which enable children to learn about building and programming robots. Similarly, the Raspberry Pi the single-board computer invented in the UK in 2012 (of which 4 million have been sold globally) is intended to help young people learn basic programming. It has attracted attention from many schools, library services, and hobby groups and created a community based around exploiting the opportunities for creation and invention which the device offers.
- 4.16 Until recently, the cost and complexity of 3D printers - machines that can fabricate items based on computer design files – limited the ability of children to use and engage with them. However, a number of 3D printers are now readily available which are specifically designed for educational purposes or with children in mind. The Department for Education recently reported on a year-long trial of using this type of technology in 21 schools across England¹⁵.

Use of digital devices in educational settings

- 4.17 Young children are also accessing digital devices in nursery and similar settings. Research by the National Literacy Trust found 22% of childcare practitioners report three to five year olds using touchscreen devices (compared with 100% who report children having access to books)¹⁶. Two thirds of these practitioners also reported using touchscreen devices for ‘creative activities’¹⁷. The same research illustrated that two-thirds of practitioners would like to increase the use of tablet computers, though a third did not want to increase usage, due to a mixture of relative expense, and concerns that usage affected communication development¹⁸.
- 4.18 It also seemed from the research that where touchscreens were used less it might be due to lower levels of confidence among childcare practitioners themselves even where devices had been purchased and were available for use.
- 4.19 Older children also use digital technology in formal, school environments. The use of classroom assessment tools to track children’s progress and provide real time feedback to teachers is increasing slowly. For example, use of interactive reading technology in Fayetteville, Arkansas helped teachers identify children that were struggling and provide appropriate support, helping to reduce gaps in reading comprehension between pupils and raise overall achievement¹⁹. Specifically, these tools enable real-time feedback and comparison, enabling teachers to provide more tailored support and address learning problems more quickly.

¹⁵ Department for Education (2013) 3D printers in schools: uses in the curriculum

¹⁶ National Literacy Trust (2014) Practitioner perspectives: Children’s use of technology in the Early Years – pg. 3

¹⁷ Ibid – pg. 8

¹⁸ Ibid

¹⁹ Lexia Learning: http://lexialearning.com/uploads/state/documents/Fayetteville_Case_Study_8-15.pdf

- 4.20 In 2013, educational e-book provider RM conducted a study of e-book use among a cohort of twenty-four white British Key Stage 3 boys on free school meals at Manchester Academy School in the UK. Over a five month period the study found that average progress in terms of reading age was 9 months 23 days of progress. All students made some progress but a third of the group made at least 1 year of progress. Two of the group made 2 years of progress; some caught up with and passed their chronological age in terms of reading age.²⁰
- 4.21 Also in the UK the Li Ka-Shing Foundation and Hutchison Whampoa Europe have funded a pilot project rolling out adaptive learning Key Stage 3 maths software to 100 schools²¹. The technology helps enhance learning by demystifying key mathematical concepts. Whilst this is older than the age group we are concerned with, it is a useful example of where adaptive learning technologies are being used in practice.
- 4.22 Schools are also using lesson videos from online sources. These have three main benefits. Firstly, videos enable teachers to learn more about the successful techniques and approaches of others. Secondly, videos offer pupils access to excellent teaching which can be pursued outside the classroom. Sites such as Khan Academy, O2 Learn, TeacherTube and iTunesU provide free online lessons and videos for pupils, which have been developed and uploaded by teachers, academics and other experts. Thirdly, much of this material is free for teachers to use, and therefore very accessible.
- 4.23 However, this proliferation places more responsibilities on teachers and parents to select and curate the material pupils are using to learn, to ensure it is of the same high quality they would expect from printed resources bought through established school suppliers.
- 4.24 Introducing new computer technology for educational purposes can be fraught with difficulties. Besides the UK's overhaul of computer science teaching this year, one of the biggest experiments in introducing technology to classrooms to date (in the developed world at least) has been the \$61m investment by the Los Angeles School Board in iPads for students in 58 schools. The aim was to equip students and teachers with tablets that would have access to a dedicated suite of educational apps. Unfortunately, this programme has been an expensive failure, with the School Board having to withdraw its iPads after students were able to bypass restrictions on internet access, and due to concerns about irregularities in the procurement of devices. The One Laptop Per Child programme²² aimed at children in poor and developing economies has also been found to have very mixed results.
- 4.25 Some of the best examples of introducing technology to children come not from the present and recent past but from longer ago. Notably the Hole in the Wall approach (installing computers recessed into walls on public streets in very poor neighbourhoods) pioneered in India the late 1990s by Prof Sugata Mitra now Professor of Educational Technology at

²⁰ <https://books.rm.com/case-studies/manchester-academy>

²¹ <http://www.lksf.org/image/media/pdf/Cornerstone-Maths-Press-Release.pdf>

²² For example the One Laptop Per Child (OPLC) programme in Peru and India

<http://blogs.worldbank.org/impactevaluations/one-laptop-per-child-is-not-improving-reading-or-math-but-are-we-learning-enough-from-these-evaluati>

Newcastle University which has been widely acclaimed by academics and policymakers.²³ The main distinguishing feature of Prof Mitra's work is the way in which it has not been driven by the desire to introduce particular devices, but instead has grown out of a detailed learning philosophy he refers to as Minimally Invasive Education.

- 4.26 Another widely acclaimed example is of course the British experience in the 1980s with the BBC Microcomputer which emerged via the BBC's Computer Literacy Project. This resulted in British school children being among the first in the world to have personal computers in their classrooms which they used to learn about concepts such as programming and the idea (then very new) that digital devices could control real world objects and mechanisms.

Challenges associated with children's digital access

- 4.27 Whilst digital access can be an important driver of creativity and learning for children, there are also a number of challenges which are increasingly being addressed including by educators and schools through the new Computer Science curriculum and information aimed at parents:

- Ensuring all children have opportunities to use digital technology whilst also ensuring they have a positive experiences of technology. This is for many the most significant challenge. Digital technology is neutral – which means it can be used for good, and for bad, and safety cannot be guaranteed. The recently launched iRights²⁴ campaign is the latest attempt to ensure children are neither left out from, or harmed by the opportunities of digital technology.
- Supporting children to effectively analyse and critique online material, media and messages. Where children are using the internet for learning or research related to schoolwork there is an increased challenge to help them critically assess material that they come across. This is obviously more relevant for older children but is relevant even to very young children in relation to commercials, advertising or promoted material they may encounter.
- Helping children understand what their digital shadow and their digital footprint is, how it is created and what rights they have over data which relates to them. Related to this is the need to help children understand what motivates other people (private companies or Governments) to collect information about them and what those organisations might use that information for.
- Protecting children from cyberbullying. Most of the research into incidences of cyberbullying tends to concentrate on teenagers and young adults. Nonetheless given

²³ Pro Mitra's Hole in the Wall experiments began in India 15 years ago <http://www.ascilite.org.au/ajet/ajet21/mitra.html>

²⁴ http://irights.uk/the_5_irights/

that over half of ten year olds have used a social network²⁵, this is clearly a potential issue for younger age groups as well.

- Preventing access to harmful material. A recent independent inquiry concluded that ‘many children are easily accessing online pornography’²⁶. As children gain access to the internet through new devices there will continue to be a challenge to prevent them from accessing inappropriate material.
- Ensuring that ‘screen-time’ does not become disruptive to their development. The American Association of Paediatricians (AAP) recommends that children should engage with entertainment media for no more than one or two hours per day²⁷, yet even the term “entertainment media” is already of limited use as boundaries become blurred between games, educational activities, films, commercial promotion, and making and consuming media.
- Preventing children from being financially exploited when they use online services (e.g. in-app purchases or games designed to encourage the purchase of particular products).

²⁵ <http://www.knowthenet.org.uk/articles/kids-not-equipped-coming-digital-age-nine>

²⁶ Independent Parliamentary Inquiry into Online Child Protection (2012) Findings and Recommendations: April 2012 – pg. 5

²⁷ <http://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Pages/Media-and-Children.aspx>

5. Selected case studies

- 5.1 In this section, we highlight some recent examples of how libraries, museums and other cultural institutions are using digital technology to enhance learning for children. The target age group for each item is highlighted; where projects do not directly engage children aged 3-11, they have been selected as we believe there may be potential for the idea to be transposed.

Libraries

Reading Agency and Simon Mayo: High-tech treasure hunt for QR codes

- 5.2 **Target age group:** 10-13 years
- 5.3 In 2013 around 30 libraries took part in a programme targeted at getting 10-13 year-olds more interested in books and libraries. The programme was based on Simon Mayo's *Itch* and *Itch Rocks* books. Supported by the Reading Agency and Random House, the digital treasure hunt involved children using smartphones to search for QR codes in participating libraries.
- 5.4 To take part, children downloaded an app and followed instructions provided by librarians, which sent them on a quest through the periodic table. After following a series of clues, the children accessed a website where they could enter into a competition and win prizes.

Community Libraries Art of Storytelling Project (CLASP), Birmingham: technology, story-telling and arts participation

- 5.5 **Target age group:** pre-school upwards
- 5.6 Birmingham Libraries are using funding secured from the Wolfson Foundation to support their Community Libraries Art of Storytelling Project (CLASP). The project is enabling smaller libraries outside the city centre to invest in [digital technology to support children's literacy](#), including tablets, e-readers, smartphones, and projectors. The equipment will help children experience stories in creative, visual and imaginative ways as part of a wider CLASP programme of arts events including training in storytelling for library staff. The project is being delivered with the Birmingham REP Theatre and local dance and film artists.

Toronto Public Library: Digital learning workspaces for children

- 5.7 **Target age group:** children aged 12 and under
- 5.8 At the Toronto Public Library, library users can access technology and training for free through a series of 'digital learning workspaces' on topics including design and printing, audio and video editing, web and graphic design, and coding and programming.
- 5.9 Some of the workspaces are reserved specifically for children aged 12 and under, including classes on: how to use a 3D printer; publishing your own book; using free online resources to

edit videos; Lego and K’Nex clubs; learning how to build, design and create; learning how to use a tablet; and how to create 3D selfies.

- 5.10 In late 2013 and early 2014, a new ‘maker programme’ for children called ‘Make + Create’ allowed participants to put their imagination and inventive skills to good use through a range of science, technology and art activities. One such project, Squishy Circuits, had the specific goal of giving children fun and interactive access to electricity, physics and engineering by using LEDs, toy engines and buzzers and play-dough.

Anne Hicks, New York: Children’s storytimes

- 5.11 **Target age group:** not specified, but suitable for young children
- 5.12 Anne Hicks is a children’s librarian in Rochester, New York, who has created her own blog to talk about her approach to storytime with children. Anne stresses that she does not use an iPad to simply tell stories, but instead downloads apps that are related to the storytime theme. For example, she used the *Robot Lab* app to support the telling of three different stories about Robots.
- 5.13 Anne believes that iPad apps can be used to help engage with children while they read – the equivalent of asking questions about pictures and the story, or putting on different voices. Apps can also extend storytime by creating an opportunity to continue the story, or themes of the story. Finally, Anne argues, technology is probably already an integral part of the children’s lives, so using an app for education and to promote literacy is likely to engage children already familiar with the technology.

Casa Grande Public Library, Arizona: Growing young minds

- 5.14 **Target age group:** families and children aged 3 and above
- 5.15 The library has created a programme for children and families to encourage early literacy and familiarity with digital resources. The library has more than 1,200 e-books on 25 e-readers, and schedules regular Digital Story Times for families and children aged 3 and above. Sitting together, each adult and child received an e-reader with which they can follow the story as the librarian reads the story.

Museums

Science Museum, London: Learning apps

- 5.16 **Target age group:** all ages, but the Splash! app is targeted at pre-school children
- 5.17 The Science Museum has developed a range of apps, including [Splash!](#) an interactive app for pre-school children designed to help children learn about floating and sinking through play. The app, which is based on the museum’s ‘The Garden’ interactive gallery, allows children to fill up and empty the bath, change the temperature, and play with bath toys.

- 5.18 The motion techniques of the app mean you can tip, twist and turn your phone/tablet to make water splash, slide and flow. Different bath toys have different properties, and sometimes move around in an unpredictable way.
- 5.19 The Science Museum's website also includes a range of online games to help people learn about science, including: learning about pain and how to treat it, nurturing a 'thing', building a low energy home, energy flows, excess levels of carbon dioxide in the atmosphere, creating plastics, dealing with rubbish, and more.

SS Great Britain, Bristol: "Full Steam Ahead" build your own adventure

- 5.20 **Target age group:** 10-11
- 5.21 [Full Steam Ahead](#) is an interactive game designed to teach pupils how Isambard Kingdom Brunel's determination to solve problems and learn from mistakes helped him succeed.
- 5.22 The team which runs Brunel's ss Great Britain exhibition commissioned [Aardman Animations](#) to make the game as part of a three-year Arts Council funded project with the Science Museum. Full Steam Ahead has been nominated for two games-industry [TIGA Awards](#).

Museum of Modern Art (MoMA), New York: Destination modern art website

- 5.23 **Target age group:** children aged 7 and above
- 5.24 MoMa has created a website, Destination: Modern Art, which brings their collections home to children and their families. The website allows its visitors to undertake an interactive online tour of the museum's galleries, guided by a friendly alien. You can take a detailed look at each work of art, listen to stories about the artists, and there are online and at-home activities too. The museum has also launched the [MoMA Art Lab](#), a creative play digital app for children aged 7 and over.

New York Hall of Science: Little makers programme

- 5.25 **Target age group:** three to six year olds
- 5.26 The New York Hall of Science has created a 'Little Makers' programme of paid-for sessions for children which melds STEM learning and the arts through hands-on investigations and problem-based activities where children share what they have made through storytelling. This technique solidifies scientific concepts and promotes the development of literacy and communication skills.
- 5.27 Examples of sessions run in August 2014 are:
- Exploring the properties of water. Using household materials to create a fun water wall.
 - Exploring the science behind nest making and transform recycled materials into a nest of your own.
 - Exploring the science behind citrus fruits and invent your own fizzy drink to enjoy.

- Discovering the science behind superhero powers. Design, make and build your own super gadget to ward off villains and help you save the day.

5.28 Each session costs \$8 (£4.80) per family, or \$5 (£3) for families with membership. The sessions are supported by a variety of charitable foundations.

California Science Centre, Los Angeles: Discovery Rooms

5.29 **Target age group:** under sevens

5.30 The California Science Center in Los Angeles has created Discovery Rooms, which include interactive exhibits, storytelling, hands-on Discovery Boxes, animal displays, and space for self-directed explorations of artefacts, models, and other materials. These learning environments provide opportunities for interactive, inquiry-based investigations that prepare young visitors for later science experiences.

Universities

Swansea University: Technocamps

5.31 **Target age group:** generally teenagers, but scope to target younger children

5.32 [Technocamps](#) is an ESF funded project led by Swansea University, in partnership with Aberystwyth, Bangor and the University of South Wales. The project delivers workshops to young people across Wales on programming, app development, games development, robotics and more.

5.33 Although many of the children who attend the camps are older than 11, some of the programmes would certainly be accessible to children at the upper end of the 3-11 bracket.

5.34 In addition to the camps, the Technocamps website includes a vast amount of free resources for anyone to download and use. The resources are graded 1-3, according to difficulty, and so are suitable for total beginners through to more advanced users. The range of activities includes: building scripts to create games; building programmable robots; developing apps; and learning about building networks and web-design.

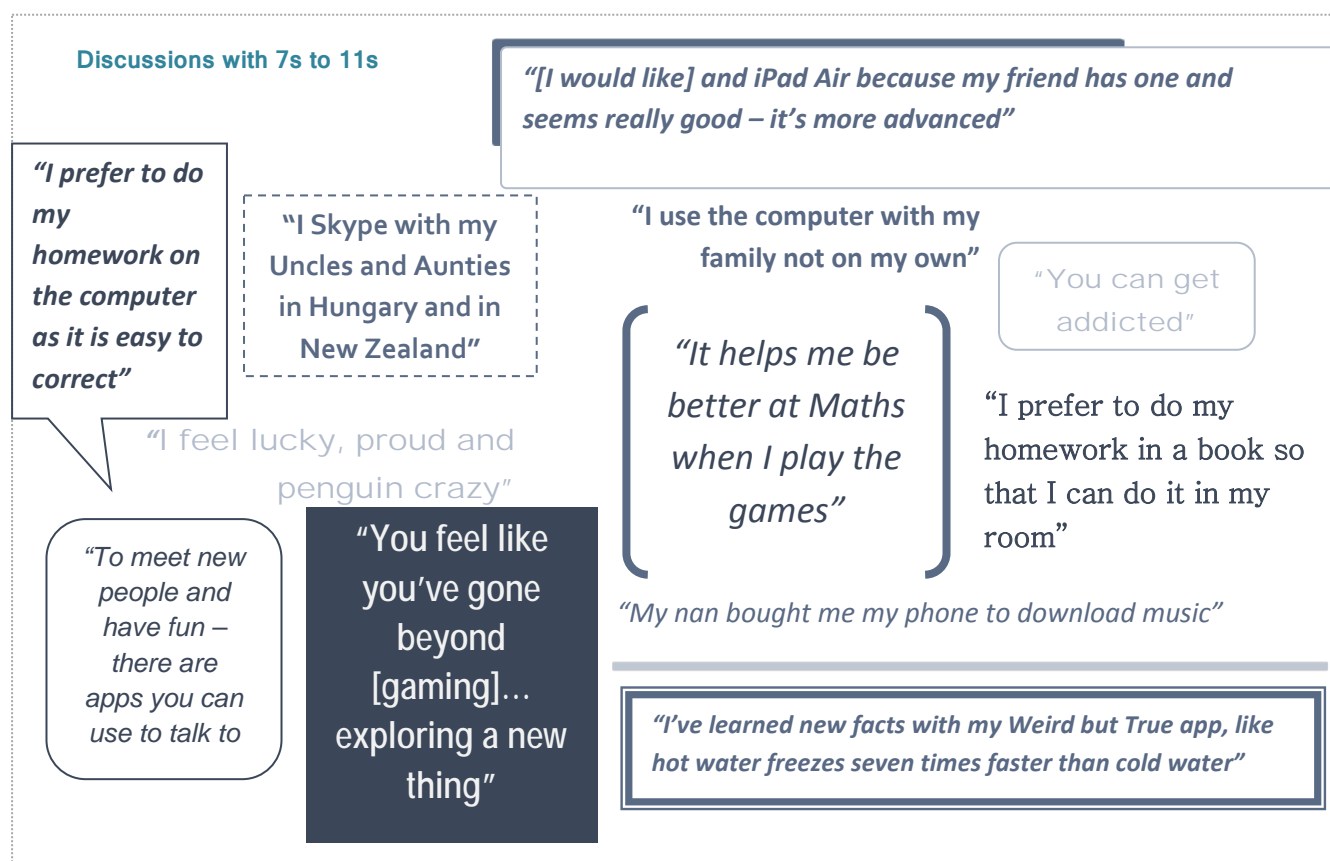
5.35 One library service, Neath Port Talbot, have begun delivering a version of the Technocamps programme to primary schools as part of a [project kick-started by the Carnegie UK Trust](#). The aim is twofold; to draw more children in to use libraries and to support schools who do not yet have sufficient computer science expertise.

De Montfort University: Pop Up play

5.36 **Target age group:** primary school children (age 7 – 11)

5.37 Working with Spark Arts for Children and digital artist Luke Woodbury, De Montfort University has been developing a new approach to reading for school children using immersive digital technology.

- 5.38 The [Pop Up Play](#) project, running at Mellor Primary School in Leicester, gives pupils the chance to read Michael Morpurgo's War Horse using digital technology as they read. Some of the special effects created by the project include trenches and battlefields, and a digital reproduction of the eponymous horse that children can stand next to.
- 5.39 The Pop-Up play project aims to immerse children in the book, allowing them to develop ideas and experience heightened emotional connections with the book's characters.
- 5.40 The project will go on to be tested at Three Ways School in Bath, libraries, museums and arts organisations across the UK. The project will also create a low-cost, open-source package for teachers, arts practitioners, librarians and other educational professionals, which should allow the immersive technology approach to spread more quickly among different institutions.



6. Conclusions and way forward

Conclusions

- 6.1 Children, like adults, have access to more technology than ever before, although there are differences across income groups which will become more significant if income inequality grows. This technology enables children to do a range of activities that a few decades ago would have been either impossible or out of the reach of most children. The scope for what children can do and create themselves is greatly amplified by digital technologies. Pictures, stories, music and video can all be shared across the world and the effort involved is often trivial.
- 6.2 But while children are immersed in digital information and technology their lives are not dominated by it. Amidst all the excitement, research data, hype, and media stories it is important to remember there is so much else going on in children's lives which is not digital, even as they approach their teens.
- 6.3 The technology that children have access to is largely 'neutral' in the sense that it can be used for 'positive' activities such as learning, creativity, making and inventing; it can be used for more 'neutral' entertainment and leisure; and without effective precautions it can expose children to a number of negative experiences. A smartphone can be a gateway to high quality learning material, or it can be used to create video projects or start a blog, but it can also simply be used to play 'Angry Birds', or worse; children can run up large bills or suffer harmful experiences. It is by teaching children how on the one hand to stay safe when using technology, but also helping them to have positive experiences of technology which enables them to grow and learn.
- 6.4 Given the scale of technological options, it is increasingly difficult for most children and adults to keep informed of the opportunities – and the challenges. Lack of awareness means that both children and adults may gravitate towards the 'easiest' or most familiar options rather than opportunities which enhance children's learning and creativity. Yet even staying with household name websites is no guarantee of either safety or quality materials in terms of children's learning. The only real protection and quality control is to enable children to develop their understanding of what digital technology can do and how the information they encounter, got there.
- 6.5 Therefore helping children and parents to understand fully the range of technology and applications available is an increasingly important function for library staff. The next section discusses examples of where libraries, museums and universities are working to improve access to digital learning and creativity opportunities.

Significant differences between pre-school and school age children

- 6.6 Taking together all the information gathered for this study, both the existing research we reviewed and our new research, we conclude that for public libraries and school libraries

there are two distinct directions for developing their services – one aimed at children themselves but the other aimed at their parents.

6.7 **For primary school age children** we conclude that there is a significant need for help as they begin their own relationship with digital information and technology. There is support libraries can give to their parents, but mainly we see benefits from supporting children directly. Libraries can support them explore the role of digital knowledge in different aspects of their lives, be that study or enjoyment, on their own or with others. We see this as part of the core purpose of libraries to help children make these discoveries, and ensure they can have positive experiences from exploring digital knowledge. Libraries can do so much more than simply teaching caution or preventing the very worst things from happening online. They can ensure all children of all backgrounds get a fair chance to ride the digital wave which will take them to social, economic, and emotional opportunities.

6.8 **Today's pre-school children** are still, to the relief of their parents, only really playing with technology, and even then it is amongst many other things. They are equally fascinated by their toys, bugs in the garden, dancing to 'Frozen', and following stories read by someone older; they also watch TV especially when their parent needs a break. Yet toddlers do seem to have an innate fascination with anything that has buttons or a touchscreen, especially when they see someone else using it. So do pre-schoolers want or need digital services from their library? Probably not. But their parents on the other hand do have many questions, concerns and gaps in their digital knowledge; how do they distinguish reputable publishers of online children's content, which games are being used in educational settings, and which are just fun, or worse - junk? Parents may also want help identifying trustworthy online information about parenting – hidden in the online blizzard of unregulated opinion, folklore, and infomercials.

Recommendations for supporting primary age children

6.9 There are a number of ways we can imagine libraries could ensure all children have the chance to explore digital knowledge and technology. Some of these would be achieved through organised activities, some by having staff trained to offer advice to those who might benefit and some are about selecting software and equipment for children which is the same as is used in local schools.

- Providing complementary access to the same websites and platforms used by local schools. E.g. if local schools use Mathletics or Education City, the libraries could provide access also so children can continue with their work after school in a trusted setting.
- Making the links between this age group's growing interest in digital and reading for pleasure. E.g. online content related to popular high-quality books. E.g. good quality author websites (like Jacqueline Wilson's) or the Summer Reading Challenge website.
- Providing access to technology children might not use in school but which might help them when at school e.g. educational robotics or technology which is popular in

friendship networks at those ages, e.g. Minecraft. These could be led by expert-parents and/or staff.

- Arranging sessions with (male and female) tech ‘geeks’ who can provide more challenge and progression than peers, teachers, or parents.
- Adopting the iRights manifesto or similar calls to action around ensuring children have a positive experience of digital information technology.
- Providing in-library access to broadband and/or Wi-Fi so that children whose parents cannot afford broadband will not be disadvantaged.
- Providing access to basic devices (especially touchscreens) so that children whose parents cannot afford a computer will not be disadvantaged.
- Offering to run in-school activities which are identical to those held in-library in order to connect with teachers and reach children who are not library members.
- Libraries could also adopt the programmes aimed at children (especially boys) from lower income families which have introduced books using e-readers rather paper format books.

And for parents of primary age children

- Support and advice about how to learn digital skills with their children as a parent-child activity.
- Information about what digital technology their children are using in and outside of school.
- Structured advice (e.g. drop ins or leaflets) about reputable content which encourages reading and literacy E.g. many parents won’t have seen the Summer Reading Challenge website, or know which children’s authors have websites.
- Advice around internet and online safety for children – advice and golden rules to tell children, but also what parents can or should do (e.g. parents may have access controls on the home computer, but children may also have free access to a parent’s unrestricted smartphone).

Recommendations for supporting parents of pre-school children

6.10 For pre-school children our recommendations focus on support for parents, especially around how to assess and find good quality content which complements what they already use the library for. This means story-telling, craft and making, early years reading and literacy, group play and socialisation. Parents who do not have older children may be particularly keen to learn about internet safety for the first time.

6.11 There are some really great e-books, story-telling websites, games, and videos available. But how can parents choose? This plays directly to the skills and experience of library staff.

- Advice to help parents distinguish between story-content from high quality authors, and stories which are essentially adverts for toys and other products?
- Advice about the characteristics of content which has been produced for educational purposes? Where are they more likely to be found? E.g. on websites connected to broadcasters?
- Suggestions of publishers of good quality crafting and making videos and tutorials? (e.g. in which consideration has been given to difficulty level or using child-safe materials).
- Explaining what websites rhyme time staff themselves choose to use to prepare their sessions, which are their favourite websites for stories and songs – and why do they trust them?
- Support for parents of under 5s to find out about the material their children might be introduced to by the local schools. E.g. maths games used by local schools, and access to those same sites which the library may offer for homework etc.

Final thoughts

“why didn’t you just look all that up on the internet?”

Comment about our research project from a boy in the Chelmsford 7-11 focus group

- 6.12 This was only a short piece of research, but we hope it provides a thought-provoking snapshot for those in the library sector about how children under 11 are currently engaging with technology. We also hope it stimulates discussions which continue, and we hope the practical use of focus groups by individual library authorities continues too.
- 6.13 Our final observations are that the lives of today’s children are not dominated by digital information, but they *are* immersed in it.
- 6.14 There are real challenges to protect children from having negative or harmful experiences of digital knowledge and technology, but the bigger risk in our view is that some children will lose out altogether, and not through lack of ability but lack of opportunity.
- 6.15 The speed, and scale of change, coupled with the innate ability of children to engage with digital technology means those who are given opportunities, guidance, and encouragement will achieve things in their lifetimes which even today seem impossible.
- 6.16 But children are still children no matter how much they shame adults with their technical proficiency. Six year olds may well have to explain to 40 year olds what Minecraft is or how to change the volume on the tablet. But at the same time children are naïve, impulsive, and, thankfully innocent, whether crossing the road or swiping an app. It is the responsibility of adults to guide and nurture them and help them achieve all they can emotionally, economically, physically and socially. In the case of digital knowledge, public libraries are one of the best ways to do that for all children, of all backgrounds.

Appendix – Focus Group raw data

BEXLEY AND BROMLEY

Name of facilitator	Frances Mason
Date of focus group	26/8/14
Location	Erith Library
Age range of children	5-9years
Number of children	8
Number of children who are library users	8
Number of adults	6
Question 1: what technology do you use? Computer Mums computer iPad Playstation Mobile phone tablet	Useful quotes: ,
Question 2: How do use it? Play games Look things up at school Make a power point on sharks Play by myself Watch films with friends Could spent 2-3hrs on it playing by themselves.	Useful quotes: 'Mother explained that one child with autism did nearly all his learning on computer. Mum stops me using it
Question 3: How does it make you feel? 'happy – play with friends Enjoyed winning games	
Question 4: What technology would you like to use that you do not already? No responses Couldn't think of anything	
Any other observations Child accepted that 'technology' broke – sister dropped phone, she broke tablet- all very matter of fact Many children did not realise or could not say how long they spent on games – mothers said for them. Older children used the biggest variety of formats	

Name of facilitators:	Cathy Garrington and Julie Priest
Date of focus group:	02/09/14
Location:	Braintree library
Age range of children:	8-11
Number of children:	4
Number of children who are library users:	4
Number of adults:	0 (2 supervising from other side of library, but didn't join in with discussion)
Points made in discussion	Useful quotes
Question 1 – <i>What technology do you use?</i> Computers (PC) Play Station Xbox (x 4) iPad mini Nintendo DS iPod TV IT suite at school Touch white boards at school	
Question 2 <i>How/What do you use it for?</i> Homework (mainly school PCs) esp. Maths Research Playing games Entertainment / leisure Listen and practice music <i>When/where do you use it?</i> At home after school sometimes, but mainly at weekends In my room In my bedroom Wherever I am <i>On your own or with others</i> On my own With my Dad- especially the Xbox Online gaming x 2	'Don't game too much in the evening. Probably read a book before bed.' 'just use it (PC) for all sorts of things – mainly for fun and entertainment'.
Question 3 <i>How does it make you feel when you're using it?</i> happy, calm, good, happy, rewarding	'If you've bought it (Xbox) with your own money, that makes you feel good.' 'annoyed when I have to start my game from the beginning because I ran out of lives'. 'feel really clever when I can do challenging games, and I like solving puzzles'.
Question 4 <i>What technology would you like to use that you don't use already and why?</i> An Xbox One x2 Instagram App (needed parental approval – not given yet) A new android phone Tablet	'Xbox one would be awesome. Controls are easier to use, and it can be voice activated, it's the best'. 'I'd like a hand held device, as I would use it more to help my literacy.'
Any other observations? Apart from inventing the new Apps they'd like to see – including one that read minds! They were very knowledgeable children. My only concern was that some of the games they told us they used – i.e. Grand Theft Auto – are not meant for their age group.	

Name of facilitators:	Cathy Garrington and Julie Priest
Date of focus group:	8/8/14
Location:	Chelmsford library
Age range of children:	8-11
Number of children:	8
Number of children who are library users:	8
Number of adults:	2
Points made in discussion	Useful quotes
Question 1 Computers (PC) Play Station Xbox iPad Nintendo DS iPod Wii E-reader Mobile phones Kindle Tablet	
Question 2 <i>How/What do you use it for?</i> Homework, Research Playing games Kindle to read books Listen to music <i>When/where do you use it?</i> At home after school In the living room In my room, In my bedroom Outside Wherever I am <i>On your own or with others</i> On my own x7 With my Dad Play games with siblings x 3 With friends x 6 Online gaming x 3	'Research for homework but also sometimes I want to research something a friend has told me about – on the Internet. Could be anything.' 'I go outside to test the connectivity of my tablet and.' 'Sometimes I share my tablet with my Dad.'
Question 3 Competitive, happy, calm, good, happy,	'It doesn't really make me feel any different.' 'Make me feel good – like when you find diamonds in Minecraft.' 'You feel like you've gone beyond (gaming) what you think you've gone, exploring a new thing.' 'I learn from my friends; I'm not very good at computers and they show me how to do stuff with my technology – like how to use the technology' 'I've learned new facts with my Weird but True APP like hot water freezes 7 times faster than cold water.'
Question 4 A Kindle iPad air A new android phone	'We seem to have everything' (parent comment) 'There's many technology which could help me to learn.' 'An iPad Air because my friend has one and seems really good – it's more advanced.' 'A Google Nexus 7 because it runs all the latest software.'
Any other observations? One very entertaining comment from a boy at the end – we thanked them and explained why we had asked them and he joked 'Why didn't you just look all that up on the Internet!'	

Name of facilitators:	Cathy Garrington and Julie Priest
Date of focus group:	30/7/14
Location:	Colchester library
Age range of children:	8-11
Number of children:	4
Number of children who are library users:	4
Number of adults:	2
Points made in discussion	Useful quotes
Question 1 Computers (PC) Play Station ,IPad, IPod, Mobile phones Surface (touch screen tablet), Satnav	
Question 2 <i>What do you use it for?</i> Use computer for homework Computer – drawing software and games after school and in the holidays Surface – for homework IPad – for games IPod – to listen to music and to play some games Play Station – for games in the holidays Children said they used these devices for homework, to learn new skills and for hobbies <i>When do you use it?</i> 1 x 1 hour per day but 2 in the holidays No time restrictions for the others <i>Where do you use it?</i> At home In the lounge In a special room where the computer is kept for everyone to use <i>Do you use it on your own or with others?</i> 3 used their technologies on their own but internet use was monitored by parents 1 x played games with Dad	<p>'I learn new skills by playing on my play Station. I can learn <i>keepy uppy</i> and that kind of thing because it shows you how to do it.'</p> <p>'I play a game where you have to get food to do cooking. My Mum and me google the recipes and then we can make them together; she likes that.'</p> <p>'I play games where you have to find hidden objects and solve the puzzle.'</p> <p>'We're not allowed to cut and paste stuff from the internet for homework.'</p> <p>'FIFA with my Dad.'</p>
Question 3 Excited, happy, it's fun keepy uppy football skills skills have improved in using the technology learned how to make stuff - crafts the cooking game shows real recipes to follow so I'm learning about cooking Completing the game It just feels good	<p>'Grumpy and tired when he comes off the computer' (parent)</p> <p>'When I've completed something it's a sense of achievement.'</p>
Question 4 X-box – because you can download games onto it for free Don't want to use any more at the moment Happy with what is at home	'There is a lot of peer pressure for them to have the latest technology.' (Comment by parent)
<p>Any other observations?</p> <p>3 of the children had mobile phones</p> <p>Both parents talked about child safety and monitored use of the Internet for all of the children. They both agreed that there was a big push at schools on child safety online and they had been invited in to sessions at their child's school</p> <p>When the boy said he wanted an x-box because you can download games for free his Mum pointed out to him that it's not actually free because you have to pay a subscription.</p> <p>The parents who stayed around whilst we had the discussion were very keen to talk about books and felt that technology usage at home had reached a saturation point.</p>	

Name of facilitators:	Cathy Garrington and Julie Priest
Date of focus group:	15/09/14
Location:	Colchester library
Age range of children:	Under five
Number of children:	7 and 7 adults
Number of children who are library users:	7
Number of adults:	7
Points made in discussion	Useful quotes
<p>Question 1</p> <p><i>What technology does your child use?</i></p> <p>Computers (PC)</p> <p>Play Station, iPad, iPhone, iPod</p> <p>Mobile phones</p> <p>Portable DVD – for on the plane on holiday or for making quiet times at home</p> <p>CD player</p>	<p>There are some lovely free apps now; you can get games and puzzles</p> <p>She loves her nursery rhymes on the iPad</p>
<p>Question 2</p> <p><i>What do you use it for?</i></p> <p>Taking photos x 3</p> <p>Listen to music</p> <p>TV and films</p> <p>Listening to stories</p> <p>Reading stories</p> <p>Games and puzzles inc jigsaw puzzles</p> <p><i>When do they use it?</i></p> <p>Anytime</p> <p>At home and quite often out and about</p> <p><i>Do they use it on their own or with you or supervised?</i></p> <p>Depends on the tech – mostly supervised as the technology is the parent's x 7</p> <p>One child who has CD player has it in her room the rest were parent's tech</p> <p>Use iPhone in the back of the car – supervised via rear view mirror</p>	<p>My little boy loves playing with the keyboard and mouse – he can't do it properly but loves copying what his Dad does.</p> <p>If they are upset in the shops you can give them a book to look at on your iPhone</p> <p>They can watch favourite programmes like Waybulu in the car.</p> <p>Usually when she's having a temper tantrum, and I need to quieten her.</p>
<p>Question 3</p> <p>How does your child behave/react when using it?</p> <p>Excited</p> <p>Really wants to do it</p> <p>Concentrates really hard</p> <p>Loves it</p>	<p>They pester you to help them use it – iPhone/iPad</p> <p>There's so much they can learn and enjoy it.</p> <p>She loves learning new words using the phone or computer</p> <p>It's a different way of exploring new things for them and they are constantly learning using technology – it's normal for them</p>
<p>Question 4</p> <p>What technology would you like your child to use, which they do not have already and why?</p> <p>Hoover (!)</p> <p>PC</p>	<p>Watch less telly now</p> <p>She prefers more interactive things than TV programmes – loves taking photos and gets really excited when she can see them and show them to everybody</p> <p>Anything which helps with their learning – it'll be computers as they get older but the iPad and smartphones are brilliant for this age</p> <p>Anything with buttons</p> <p>Get a white board in the library, good technology to use at an early age.</p>
Any other observations?	

Name of facilitators:	Cathy Garrington and Julie Priest
Date of focus group:	30/09/14
Location:	St Michaels Primary,
Age range of children:	9 and 10
Number of children:	10
Number of children who are library users:	7
Number of adults:	0
Points made in discussion	Useful quotes
Question 1 – <i>What technology do you use?</i> iPad, Computer, iPod, iPhone, Kindle, x-box, Playstation3, Wii, Smartboards (at school), Huddle, Microwave, docking station, calculator, Circuitry and BBox (Robots), TV	
Question 2 <i>How/What do you use it for?</i> Gaming, research, homework, Gmail, Instagram (photos), Skyping, making videos, Facetime <i>When/where do you use it?</i> Home and school In the lounge, on the sofa, on a table under the stairs, in my own computer room, in the kitchen on the table 7 of the ten used their technology in their own bedrooms at times	We use Mathletics at home on the computer. Sometimes we measure things at home using the iPad. I skype with my Uncles and Aunties in Hungary and in New Zealand. I take my iPad everywhere; I play snakes and ladder in the car. I took my iPad on the long journey to Cornwall. I don't want it when I'm there because there's the beach and everything.
Question 3 <i>How does it make you feel when you're using it?</i> happy, good, happy, angry when things go wrong, I'm having fun,	It stops you from getting bored You can get addicted It's not boring You can get thumb ache I feel like I'm learning something new – like with the controls It's annoying when my brother just wants us to play the games he likes
Question 4 <i>What technology would you like to use that you don't use already and why?</i> iPad Air because I could roll it up and keep it in my pocket – I wouldn't be worried about leaving it in the car PlayStation 3 because it has better games I'd like a Wii because they look like fun A smart TV/3D TV A Huddle because they are good fun A Kindle fire for games A Wii you An iPhone 6 – it's the latest	
Any other observations? 6 out of the ten children used FaceTime with family and friends whilst 2 used Skype to keep connected with family far away. Lots of talk about playing games with family; mostly brothers and sisters. One boy said his Mum loved a certain computer game and they played that together.	

Name of facilitators:	Apryl Hammett and Natalie Brown
Date of focus group:	25/09/14
Location:	Chelmsford library
Age range of children:	Under five 6 months – 3 years
Number of children:	7 children and 6 adults
Number of children who are library users:	6
Number of adults:	7
Points made in discussion	Useful quotes
<p>Question 1</p> <p><i>What technology does your child use?</i></p> <p>Ipads</p> <p>Smartphones</p> <p>Television</p> <p>Computer</p> <p>iPod</p> <p>Camera (on smartphone)</p> <p>Radio</p> <p>CD Player</p>	<p>Listens to the CD in the car</p> <p>Plays with the iPhone/Smartphone</p> <p>Loves the camera on the iPad</p> <p>Love CBeebies after lunch while I am clearing up. The story sends her off to sleep for her afternoon nap</p> <p>Listens to the Radio in the car and hums the Heart FM theme tune.</p>
<p>Question 2</p> <p><i>What do you use it for?</i></p> <p>Watching TV</p> <p>Taking Photos of the Cat!</p> <p>Learning – the twins always want to do what they see on crafting programme.</p> <p><i>When do they use it?</i></p> <p>TV – unsupervised</p>	<p>TV as a distraction for them whilst I get on with clearing</p> <p>She loves Something Special and Mr Bloom. As she is an only child and goes to pre-school in the morning, she sees Mr Tumble as her friend and talks back to him when he asks a question.</p> <p>He loves to sign back to Mr Tumble.</p> <p>I have an app on my phone and the children love it. It's a learning game and it's free. A brilliant resource.</p>
<p>Question 3</p> <p><i>How does your child behave/react when using it?</i></p> <p>The little one loves taking photos and letting me guess what he has taken a photo of. She loves it when I get it wrong.</p> <p>She chats all the time to Peppa Pig and my older son used to do the same with Alpha Blocks</p> <p>She loves it and mimics their actions on the TV – e.g. smiling, frowning, happy, and sad.</p>	<p>She is completely at home using phone. She knows which picture is the Peppa pig App and uses it. She often talks to my husband and my parents.</p> <p>Evie knows when it's time to watch TV and when not to. She knows that story time on the TV is normally before a nap. It's part of our routine.</p> <p>I think that when it is used correctly – e.g. for learning it's a brilliant resource, what you have to be careful of is overuse and then misuse.</p> <p>It's a convenient tool when you have something else to do.</p>
<p>Question 4</p> <p><i>What technology would you like your child to use, which they do not have already and</i></p>	<p>Quotes</p> <p>'Let kids be kids'</p>

<p>why?</p> <p>I had a very adamant group that children have too much technology. One mother went as far to say that she hadn't let her older son watch the TV until he was 2.</p> <p>She felt books were a priority and she wanted to instil books, before they had TV. Whilst she was saying this the child was happily playing on the I phone with a Peppa Pig app and counting the numbers (Joshua 20 months)</p> <p>Evie's mum said that she would like her to have a Leap Pad later on.</p>	<p>'Let them play'</p>
<p>Any other observations?</p> <p>I feel that Joshua's Mum led the group with the final question about what further technology you would like your child to use. If she hadn't spoken so definitely, people may have been more open.</p>	

ESSEX

Name of facilitators:	Apryl Hammett and Natalie Brown
Date of focus group:	23/09/14
Location:	Chelmsford library
Age range of children:	Under five 6 months – 3 years
Number of children:	7 children and 7 adults
Number of children who are library users:	7
Number of adults:	7
Points made in discussion	Useful quotes
<p>Question 1</p> <p>What technology does your child use?</p> <p>iPads</p> <p>Smartphones</p> <p>Television</p> <p>Computer</p> <p>iPod</p> <p>Camera (on smartphone)</p> <p>Radio</p>	<p>She watches the Internet on the TV and my iPad– Children's series of Fireman Sam and Peppa Pig</p> <p>She plays with the iPod</p> <p>Loves swiping the screen on my phone</p> <p>Plays the YouTube videos of the Tweenies on my iPad</p> <p>Listens to Radio in the car</p>
<p>Question 2</p> <p>What do you use it for?</p> <p>Watching television(Peppa Pig)</p> <p>Learning how to craft</p> <p>When do they use it?</p> <p>iPod/iPhone – supervised</p> <p>TV and iPad: semi supervised/unsupervised</p>	<p>They dance to the theme tunes and sing to the songs</p> <p>I use it (the TV and the Ipad) as a babysitter</p> <p>She watches and copies what they are doing.</p>

<p>Question 3 <i>How does your child behave/react when using it?</i></p> <p>Katie 10 months – copies the characters on the TV</p> <p>Copies the activities on the TV programmes</p> <p>Copies the characters animation (i.e. when the character laughs – the child does)</p> <p>Enjoys it</p> <p>Points out and talk out loud when they recognise something</p> <p>Louie loves the baby TV, but if it is turned onto regular TV, Louie (11/2 months) loses interest.</p> <p>Learns actions and nursery rhymes</p> <p>Role Play</p>	<p>Mum found Cayden role playing on the phone asking Fireman Sam for help.</p> <p>Olivia copies the characters emotions, laughing etc.</p> <p>Likes Mr Tumble on Something Special as you gets to see the words.</p>
<p>Question 4 <i>What technology would you like your child to use, which they do not have already and why?</i></p> <p>Louie's Mum wanted nothing else, as she wanted to do more active things, like going to park.</p> <p>The other parents talked about doing as opposed to watching. Meeting other parents and children – e.g. Baby and Toddler time.</p> <p>I would like something interactive on the TV</p> <p>Touch Screen TV</p> <p>Something with no adverts</p> <p>More free apps for the phone</p>	<p>Natalie and I had one group, but there was a very divided response between those I was listening to and those Natalie was listening to.</p> <p>Natalie's parents wanted no more technology, whereas the parents I was writing for wanted more technological research. Wanted a greater range of free apps and things that would keep their children 'entertained'</p>
Any other observations?	

GATESHEAD

Name of facilitator	Chris Myhill/Deborah Bell
Date of focus group	23/9/14
Location	Gateshead Central Library
Age range of children	7-10 years
Number of children	7
Number of children who are library users	7
Number of adults	2
Question 1: what technology do you use?	Useful quotes: X Box, Minecraft, Lego Star Wars, Mathletics and maths games, Nintendo DS – Harry Potter, Lego games, nana's tablet. My computer for research and my tablet for playing. Nintendo DSi.
Question 2: How do use it? When do you use it?	Useful quotes: DSi I use in my bedroom or mum's room. I use it for playing and sometimes use it for chat – usually with my sister. Club Penguin is puzzles and challenges, and I have got onto the next level challenge.
Question 3: How does it make you feel?	Amazing and lucky. It inspires me to try harder to beat people. I feel lucky, proud and penguin crazy.
Question 4: What technology would you like to use that you do not already?	A phone – I'm too young. A touch screen phone – it's too expensive. An MP3 player – I'm too young but will probably get one in secondary school. An Xbox or PlayStation – they're too expensive.
Any other observations	
I have learnt how to do maths. Apps are great. There is an app for the Quran which has helped me learn how to pray. Cybercafe teaches me how to stay safe.	

GATESHEAD

<i>Name of facilitator</i>	<i>Chris Myhill/ Deborah Bell</i>
<i>Date of focus group</i>	<i>30/9/2014</i>
<i>Location</i>	<i>Gateshead Central Library</i>
<i>Age range of children</i>	<i>7-10years</i>
<i>Number of children</i>	<i>7</i>
<i>Number of children who are library users</i>	<i>7</i>
<i>Number of adults</i>	<i>3</i>
<i>Question 1: what technology do you use?</i>	<p><i>Useful quotes:</i> <i>Club Penguin: Elite Penguin Force - £5,579 earned on the game.</i></p> <p><i>iPad – building games – you learn about things. – The games I play are ‘Clash of Clans’, ‘Forge of Empire’ and ‘Star Wars’. I just use my brain for homework. I use laptop and websites for homework. Mathletics tests your brain. iPad – Minecraft/Robbery Bob A tablet. My phone for contacting people. iPad and TV iPad to play Minecraft.</i></p>
<i>Question 2: How do you use it? When do you use it?</i>	<p><i>Useful quotes: I use it on my own in my dad’s office. I use it by myself most of the time. I use it close to the wi-fi box. I have just got banned – it’s a terrible punishment if my tablet is taken away.</i></p> <p><i>Mostly I play kicking a balloon around.</i></p> <p><i>I literally love Club Penguin.</i></p> <p><i>I just like watching a bit of YouTube.</i></p> <p><i>Lexia helps you to Read/Write and stuff.</i></p> <p><i>No end of building on Minecraft – I learn how different bricks and materials can be used to make something else – I am trying to make a red emerald torch.</i></p>
<i>Question 3: How does it make you feel?</i>	<p><i>Elated with joy. Happy, excited and grateful until my brother takes it away.</i></p> <p><i>Excited – games are nice.</i></p>
<i>Question 4: What technology would you like to use that you do not already?</i>	<p><i>A TV in my room, so I can relax at night – not fair.</i></p> <p><i>A mini pink iPad – I’m too young.</i></p>
<p><i>Any other observations:</i></p> <p><i>Fifa teaches me what NOT to do in football.</i></p> <p><i>Minecraft teaches me how to build.</i></p>	

HULL

Name of facilitators:	Donna Jones, Jo Parkinson, Katie Holdstock
Date of focus group:	16.9.14 & 22.9.14
Location:	Freedom Centre & Gipsyville Library
Age range of children:	Pre school
Number of children:	Altogether
Number of children who are library users:	7 & 6
Number of adults:	5 & 5
Points made in discussion	Useful quotes
<p>Question 1</p> <p>Parent's iPhone for occasional music and games.</p> <p>iPod for music.</p> <p>Kingdom camera.</p> <p>Mobile phone.</p> <p>Children's laptop.</p> <p>PC – mouse with help.</p> <p>Television.</p> <p>Cd player.</p> <p>Nintendo DS</p> <p>Leapfrog Leappad</p> <p>Smart phone</p>	
<p>Question 2</p> <p>With help from parent.</p> <p>Playing/Education – phonics, numbers, the world, technology.</p> <p>PC at the library.</p> <p>Educational games e,g number games, writing games, memory games</p> <p>Used a variety of times during day at home or when travelling</p> <p>Used with parent, grandparent, auntie and on their own, once learnt to use it.</p> <p>Playing games</p> <p>Looking at photos</p> <p>You Tube (Educational Resources)</p>	
<p>Question 3</p> <p>Enjoys using but doesn't keep attention for long.</p> <p>Child interested, engrossed and inquisitive.</p> <p>Can get obsessed with it, hard to get them off.</p> <p>It's great to use when travelling or waiting at doctors etc. to keep them occupied.</p> <p>Only let them on for small time each day</p> <p>Really enjoy and learning lots from the games they have and using</p> <p>Enjoys using technology</p>	
<p>Question 4</p> <p>We will slowly progress to a computer or tablet.</p> <p>Once they are a suitable age I would allow them to have a tablet and then develop onto a laptop, but a table from about 8 years and laptop about 10 years on.</p> <p>Educational games and websites</p>	
Any other observations?	
As a parent whilst my child is under 5 I like to limit and control her access to technology.	

KINGSTON

Name of facilitators:	Ben Lee Mike Treacy (Scribing) Anita Lewis
Date of focus group:	Thursday 4th September 2014
Location:	New Malden Library
Age range of children:	0-4
Number of children:	18 children
Number of children who are library users:	all
Number of adults:	9 adults
Points made in discussion	Useful quotes
Question 1. What technology does your child use?	I-Pad, I-Phone, I-Pod. Remote controls, scanners in supermarkets, 'Octonauts' on TV, CD Player, DVD player, self issue in the library, Tablet, cameras on phones, video cameras, telephone (as in land line), Electric toys, 'Touch pen with a globe- its very popular with my friends' (this latter comment from a mum after the session has ended)
Question 2 How do they use it? (i.e. the technology)	Making a noise- they will push any button that makes a noise Looking at photos- reviewing the day Children love photos of themselves in I-Phones. We use phone to video and review the day Map function- to find daddy's work place Watching TV whilst on holiday Using apps Skype- face to face communication. We also use it on the desk top CBB's on I-Pad Games and puzzles apps Story apps- turning a page Use Google to look up images of cars and tractors E Books I=Pod Touch for puzzles Creativity- [my child] does a little drawing on I-Pad but mostly on paper Musical creativity sound app "Doing2- pictures and puzzles
Question 3 How does your child behave / react when using it?	Totally love it "transfixed" but in a focused way Depends what it is if children are focus to maintain attention 'Sometimes he watches me having a conversation' {on the phone] One parent commented she's worried she's using it {technology] too much
Question 4 What technology would you like your child to use, which they do not already, and why?	'Technology not good for little ones. Try to keep a limit on it'. It is becoming a problem Digital camera [She's] interested in the TV remote but not sure how to use it
Any other observations? Children learn very quickly [my child] touches big screens at the railway station (this said in relation to touch screen technology and the child expecting a similar response to touching the advert)	

KINGSTON

Name of facilitators:	Ben Lee Mike Treacy (Scribing) Safa Bowskill
Date of focus group:	Wednesday 1st October 2014
Location:	Hook and Chessington Library
Age range of children:	1-4
Number of children:	10 children
Number of children who are library users:	all
Number of adults:	10 adults (7 library members and 3 non members)
Points made in discussion	Useful quotes
Question 1. What technology does your child use? I Pad V Tech games- PlayStation 'My First Laptop' Leap Pads with pen to follow what's going on the screen (following stories) Mobile phone TV remote controls	
Question 2 How do they use it? (i.e. the technology) 'Talk to it' Trying the remote even though they are not sure what it does Holding phone to ear For electronic books Watching cartoons on laptops They like the different noises on toy laptops	'Imitate' 'When they are this age [pointing at tiny toddler] they imitate but when they are this age [points at older toddler] they are starting to interact with it' 'Young son follows older sister in trying to use the DVD player' 'Imitate and copy' 'She might babble' [at the electronic device]
Question 3 How does your child behave / react when using it? Pretty focussed especially when they are tired Mixture of reactions	'Keeps [their] attention' 'Dancing and moving to music' 'wants to be part of what the parent is doing'
Question 4 What technology would you like your child to use, which they do not already, and why? Voice search technology	'They have got enough technology' 'I want them to read proper books' 'Got their whole lives to be doing it' [using technology]
Any other observations? Just one comment about using voice activated technology and getting a voice response	

KINGSTON

Name of facilitators:	Mike Treacy Christa Day (Scribing)
Date of focus group:	Tuesday 7 October 2014
Location:	Surbiton Library
Age range of children:	0-4
Number of children:	10 children
Number of children who are library users:	all
Number of adults:	9 adults
Points made in discussion	Useful quotes
Question 1. What technology does your child use? V Tech play laptop Skype x 3 I Pads, I Phone, Smart Phone Tablet Remote control Library self issue Self scan in supermarkets	
Question 2 How do they use it? (i.e. the technology) Copy adults In car- long journeys Exploring pressing keys and like sounds They like using a mouse	'[he] likes opening and closing my laptop' '[they] don't really use it. Just mimic. It's a bit bash! Bash!'
Question 3 How does your child behave / react when using it? Happy and calm Excited	'Happy if he has got the phone off me' "Looks at me as if to say 'I'm clever' when changing channel" 'She knows if she has the dummy' [inference here is that children learn quickly what is real technology and what is play] 'I don't let my child have the phone or remote control'
Question 4 What technology would you like your child to use, which they do not already, and why? Parents want to limit it [technology] Too easily accessible Addicted- don't want to spend too much time	'Something appropriate for the age group' [under one] 'I don't want them to read on I Pad. Want them to use books' 'Prefer books'
Any other observations? One parent works in a child care centre. She said children may appear to be calm during a DVD/Video but they get over stimulated later once the DVD/Video has finished Another mum said it as an adult she gets over stimulated if she looks at IT before going to bed and needs to read a book [drawing an analogy with previous comment] Parents and carers commented that they like the tactile feel of a book, but see a place for both books and IT The group expressed concern over the content of IT. Adults need to be more vigilant One parent said she would never allow IT in the child's bedroom as limits control	

LANCASHIRE

Name of facilitators:	Sarah Bell, Liz Maskell
Date of focus group:	25.9.14
Location:	Springfield School
Age range of children:	Age 6
Number of children:	4
Number of children who are library users:	3
Number of adults:	2
Points made in discussion	Useful quotes
<p>Question 1</p> <p>Children were very excited to discuss technology. They spoke about having laptops and tablet computers. They didn't have their own phones but used parents' phones.</p>	
<p>Question 2</p> <p>They mainly used the devices to play games on. Clash of Titans and Minecraft seemed popular. Two children said they had free access to YouTube, and they like to watch 'Frozen' songs and find cartoons on there.</p> <p>They all said they access the technology on their own rather than with an adult. They mainly use it after school at home. Obviously we also allow them to use technology in school during the school day.</p>	
<p>Question 3</p> <p>They liked using YouTube to find fun things to watch.</p> <p>Two of the children said they play maths games, that have been recommended by school.</p> <p>One child says she uses a paint package and loves painting pictures.</p> <p>One child said she uses her Mum's kindle to read books and also reads on the computer.</p>	<p>"It's fun reading on the kindle and you never lose your place".</p>
<p>Question 4</p> <p>One child said they haven't got a computer but they have a kindle.</p>	<p>"I'm getting a computer soon, when we get some money!"</p>
<p>Any other observations?</p> <p>The children enjoyed the discussion. They mainly wanted to focus on the games aspect of technology and only discussed learning and educational games when asked specifically about those issues.</p>	

LANCASHIRE

Name of facilitators:	Sarah Bell and Liz Maskell
Date of focus group:	25.9.14
Location:	Springfield School, Primary
Age range of children:	9
Number of children:	4
Number of children who are library users:	4
Number of adults:	2
Points made in discussion	Useful quotes
<p>Question 1</p> <p>Tablet, play station, x box, Samsung phone, iPad, iPod, computer (desk top and laptops) and TV, Nintendo Wii</p> <p>Most often uses: iPod, tablet, TV, computer</p>	
<p>Question 2</p> <p>The children spoke about variety of uses for the technology and where they used it:</p>	<p>TV in bedroom</p> <p>Xbox for talking to friends in other parts of UK – we challenge each other to games</p> <p>Play games on tablet and to do homework, in family room</p> <p>iPod – research and games – in my room or with my family</p> <p>Computer to print things off and do homework and play games e.g. Cool Maths games</p>
<p>Question 3</p> <p>The children all lit up when asked how technology makes them feel and were desperate to get their enthusiasm across to me.</p>	<p>Enjoy watching Barbie movies on YouTube as I don't have them on DVD</p> <p>I like typing as I can type quite fast</p> <p>I like learning about technology and playing car games.</p> <p>Enjoy printing homework at home. It helps me be better at Maths when I play the games.</p>
<p>Question 4</p> <p>Things they wished they had but didn't - X Box, computer, printer, iPad</p>	<p>Its too much money to have all the consoles.</p> <p>Might get a phone soon – when I go to high school.</p>
<p>Any other observations? The children all stated that they love technology and without it the world would be very boring. They laughed at the thought of not having any of these devices.</p>	

LANCASHIRE

Name of facilitators:	Jill Rimmer –Branch Manager Lynn Wissett – Children's Volunteer
Date of focus group:	29th July, 2014
Location:	Tarleton Library
Age range of children:	5-7 years
Number of children:	8 (3 boys and 5 girls)
Number of children who are library users:	All
Number of adults:	5
Points made in discussion	Useful quotes

Question 1 What technology do you use? Nintendo Gameboy - Home Computer IPad - Mobile Phone - Leap Pads Laptops - Tablet Computer - Minecraft - Netflix	"I would like to spend more time on the computer"
Question 2 What do you do on it? (i.e. the technology) Games - Questions and Answers - Word Games Make Loom Bands - Draw Pictures - Use the internet - Homework Research - Favourite Websites - TV Programs (Disney, CBBs)	"I like using it with others to play games"
Question 3 How do you feel when you're doing it? Exited - Happy - Competitive	Quote from one of the Mums "Using the computer makes my children moody"
Question 4 What technology would you like to use that you don't use already and why? (i.e. "why would you like to use it?" – not "why don't you use it already? Mobile phone - IPads - Skype	"I would like an iPad"
Any other observations? When answering questions in most cases the children needed prompts from parents due to the age of the children. Tarleton is a very affluent area and this is reflected in what technology they have available to them.	

LANCASHIRE

Name of facilitators:	Jill Rimmer - Branch Manager Lynn Wissett - Children's Volunteer
Date of focus group:	12th August, 2014
Location:	Tarleton Library
Age range of children:	5 – 7 years
Number of children:	10
Number of children who are library users:	All
Number of adults:	7
Points made in discussion	Useful quotes
Question 1 What technology do you use? Tablet Computers - Mobile Phones - Laptop Computers - IPads - iPods - Blackberry - DVD Players - Nintendo DS	"I take my DS everywhere with me so I don't get bored"
Question 2 What do you do on it? (i.e. the technology) Play Games - Letters/Words - Draw Pictures Education City - Websites BBC Bitesize - School Websites - Research Homework - Print off colouring sheets	"My sister helps me with homework on our computer"
Question 3 How do you feel when you're doing it? Enjoy using it - Exited - Happy - Frustrated	"I would like to spend more time using it"
Question 4 What technology would you like to use that you don't use already and why? (i.e. "why would you like to use it?" – not "why don't you use it already? Mobile Phone - iPhone - Ipad - iPod - Some Games - DVD	"I would like my own computer"
Any other observations? None of the children mention E readers	

LANCASHIRE

Name of facilitators:	Jill Rimmer - Branch Manager Lynn Wissett - Children's volunteer
Date of focus group:	2nd September, 2014
Location:	Tarleton Library
Age range of children:	5 – 7 years
Number of children:	8 (5 girls and 3 boys)
Number of children who are library users:	All
Number of adults:	4
Points made in discussion	Useful quotes
Question 1 What technology do you use? Desk Top Computers - Tablets - Wii Games TV to watch games - Nintendo DS	Two children had looked at the Summer Reading Challenge website
Question 2 What do you do on it? (i.e. the technology) Use Friv for Schools Mathletics - Colouring Sheets - Word Searches - Summer Diary - Play Games - DVDs - Research Homework - Draw Picture	
Question 3 How do you feel when you're doing it? Happy - Excited when playing games - Competitive	"I like it, but get a headache if on it too long"
Question 4 What technology would you like to use that you don't use already and why? (i.e. "why would you like to use it?" – not "why don't you use it already?" Mobile Phone - Tablet	"I would like my own laptop"
Any other observations? Parents in this group all said they limited their children's use of computer technology	

LANCASHIRE

Name of facilitator	Gary Wilson
Date of focus group	18 September 2014
Location	Chatburn Library, Lancashire
Age range of children	5-6 years
Number of children	10 (5 boys, 5 girls)
Number of children who are library users	4
Number of adults	1 accompanying the children, 1 facilitator, 1 scribe
Question 1: What technology do you use?	Tablet, 5; Desktop pc, 5; laptop pc, 7; mobile phone, 6; television, 9; iPod, 6; e-reader, 4; Wii, 6; Nintendo DS, 6
Question 2: What do you do on it?	(Computer) "I do lots of games"; "I put some music on it"; "I colour on it"; "games" (Tablet) "play games, listen to music, paint"; "I watch films"; "game"; "I go on Facebook"; "I go on Moshi Monster game" (Kindle) "I help my dad on it"; "I help my dad to move it (scroll the text)"; "I read <i>The Cow Jumped Over the Moon</i> "; "I read lots of different books"
Question 3: How do you feel when you're doing it?	"Happy" (four children said this); "relaxed" (When asked 'what do you enjoy): "playing games", "watching films" (When asked what do you learn from doing it, no one volunteered an answer).
Question 4: What technology would you like to use that you don't use already and why?	"I don't have my own iPad – I would play my own games and watch my own films"; "iPod to listen to music"; "a tablet of my own"; "a DS (Nintendo DS games console)"
Any other observations: *The child who said she uses Facebook is six years old; she claimed there were no adults helping her during her usage and she boasted that she could log in anytime, that she 'knew how to do it herself'.	

STAFFORDSHIRE

Name of facilitator	Sue Ball
Date of focus group	29/7/14
Location	Lichfield Library, Staffordshire
Age range of children	7-9 years
Number of children	9 (4 boys and 5 girls)
Number of children who are library users	9
Number of adults	6
Question 1: what technology do you use? Kindle Fire, laptop, iPad, tablet, computer, TV to watch programmes and play games, Hudl	Useful quotes: 'Like books and Kindles equally' 'Prefer books, holding it in my hands' 5 children had looked at the Summer Reading Challenge website
Question 2: How do use it? Homework, games (lots), for fun Where? At home, on holiday, in school (only 1 child)	Useful quotes: 'For school work and to play games' 'To meet new people and have fun – there are apps you can use to talk to people'
Question 3: How does it make you feel? 'Happy' – lots feel happy Enjoy playing games Enjoy meeting new people	
Question 4: What technology would you like to use that you do not already? Nintendo DS, iPad, computer x 2	
Any other observations 5 children had used the Summer Reading Challenge web site. They used and liked the videos and the games. Some had used the book finder. They said that it was a good introduction to the Challenge. Technology is in the main used on their own and without parental supervision.	

STAFFORDSHIRE

Name of facilitator	Sue Ball
Date of focus group	29/7/14
Location	Shenstone Library, Staffordshire
Age range of children	5 & 7 year olds
Number of children	2 girls
Number of children who are library users	2
Number of adults	1
Question 1: what technology do you use? Tablet, TV, DVD player, story tapes, laptop	Useful quotes:
Question 2: How do you use it? Homework using a laptop – Education City, e-mail, playing games, story tapes in bed, DVD player – in the car	Useful quotes: “I use the story tapes before everyone gets up”
Question 3: How does it make you feel?	“I like using it”
Question 4: What technology would you like to use that you do not already?	“I like a book”
Any other observations	
Name of facilitator	Sue Ball
Date of focus group	7/8/14
Location	Barton Library, Staffordshire
Age range of children	8-11 year olds
Number of children	6 (3 boys & 3 girls)
Number of children who are library users	6
Number of adults	0
Question 1: what technology do you use? Xbox, tablets, kindle fire, PC, Wii, mobile phone, iPad, PlayStation, iPods, Motorola, Microsoft, Apple, HP	Useful quotes:
Question 2: How do you use it? Games, you-tube (watching and making films), sending e-mails, homework, listen to music, reading books, downloaded the Summer Reading Challenge app, played some of the games on the Summer Reading Challenge website.	Useful quotes: “I use a computer for homework and research” “The games must be appropriate for the age and must be non-violent” “I prefer to do my homework on the computer as it is easy to correct mistakes” “I prefer to do my homework in a book so that I can do it in my room” “I like the kindle fire” “I don’t like the kindle as it hurts my eyes”
Question 3: How does it make you feel? Excited – games Relaxed – books Frustrated	“It is frustrating when the lap top dies”
Question 4: What technology would you like to use that you do not use already? PlayStation 4, Xbox, mobile phone, iPad air, iPod	“I want a phone” (8 year old)
Any other observations Computers help me to learn more – instant access to information. The Summer Reading Challenge app relies on adults. On a rainy day I spend all day on the Xbox.	

STAFFORDSHIRE

Name of facilitator	Sue Ball
Date of focus group	11/8/14
Location	Cannock Library, Staffordshire
Age range of children	8-11 year olds
Number of children	8 (5 girls & 3 boys)
Number of children who are library users	8
Number of adults	4
Question 1: what technology do you use? Xbox (Xbox-live), DS, tablets, iPad, kindle fire, PC, laptop, TV, mobile phone, PlayStation, Skype, Scratch, DVD player	Useful quotes: Some parents at this session commented that they did not really understand all the different technology that the children were referring to
Question 2: How do you use it? Games and for entertainment, eg watching films. Information for homework and also information on how to do things, for example making loom bands. Reading books. Some had looked at the Summer Reading Challenge website and some had downloaded the Summer Reading Challenge app. All the children used technology on their own although the equipment belonged to 'the family'. One child used technology every day.	Useful quotes: Our homework is set by our school on the computer. We can access it from home through Learning Pad.
Question 3: How does it make you feel? Frustrated Happy – like using it Enjoy using it	When I am trying to do something hard on the computer I get frustrated
Question 4: What technology would you like to use that you do not use already? Xbox in the library. Hoverboard, a petrol hoverboard. My own computer (not have to share with the family)	
Any other observations	

STAFFORDSHIRE

Name of facilitator	Sue Ball
Date of focus group	20/8/14
Location	Leek Library, Staffordshire
Age range of children	7-9 years
Number of children	12 (3 boys, 9 girls)
Number of children who are library users	12
Number of adults	6 adults
Question 1: what technology do you use? TV, DVD player, Wii, Nintendo DS, Computer, Kindle, iPad, iPod, tablet, mobile phone,	Useful quotes:
Question 2: How do you use it? Watch films, play games eg Minecraft, downloading music, to read books, watching TV, homework on a computer, making stories.	I use Microsoft word on the computer to write stories. I prefer the Kindle to a real book because I read a lot and can store lots of books. I also like that it tells you the % of story

	<p>read. I use my Kindle on my own.</p> <p>We have two ipads that we share in our family.</p> <p>I use the computer with my family, not on my own.</p> <p>My nan bought me my phone to download music.</p>
<p>Question 3: How does it make you feel?</p> <p>Excited when playing games.</p> <p>Pleased and happy.</p> <p>Frustrated when the screen freezes.</p>	
<p>Question 4: What technology would you like to use that you do not use already?</p> <p>Games – but not sure what sort of games.</p>	
Any other observations	

STAFFORDSHIRE

Name of facilitator	Sue Ball
Date of focus group	21/8/14
Location	Stone Library, Staffordshire
Age range of children	3-9 years
Number of children	4 girls
Number of children who are library users	4
Number of adults	2 adults
<p>Question 1: what technology do you use?</p> <p>Computer, iPad (3 out of the 4 girls had access to iPads), DVD player, mobile phone (9 year old girl), TV</p>	Useful quotes:
<p>Question 2: How do you use it?</p> <p>iPad – for games, especially educational games (3 & 6 year old girls), for homework (9 year old), download music onto phone and computer, 5 year old girl uses CBeebies app on her father's 'phone. The 5 year old likes a painting app on the school computer. The mobile phone and iPads are used to take photos. Watch films, especially Disney films.</p>	The 3 year old taught her mother how to take photos using the iPad.
<p>Question 3: How does it make you feel?</p> <p>The games – excited.</p> <p>Not sure.</p>	I feel different things at different times, when I am using the computer for different things.
<p>Question 4: What technology would you like to use that you do not use already?</p> <p>Mobile phone apps for games.</p> <p>Games would be good in the library.</p>	
<p>Any other observations</p> <p>The mother of the 5 year old said that they control and limit her access to the computer.</p> <p>The mother of the 3 & 6 year old girls said they use two 'family' iPads, which they do use on their own unsupervised.</p>	

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