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# Exploring Play and Creativity in Pre-Schoolers' Use of Apps

## A Report for Early Years Practitioners

TAP Technology and Play

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

The University Of Sheffield.

CBeebies BBC

dubit

Foundling Bird

Monteney Primary School

# **Exploring play and creativity in pre-schoolers' use of apps:** Report for early years practitioners

# Background to the project

This report outlines the key findings of a co-produced study, developed in collaboration between academics in the Universities of Sheffield and Edinburgh, the BBC (CBeebies), Monteney Primary School and the children's media companies Dubit and Foundling Bird (Appendix 1 outlines the project team members and Advisory Board members). The project was co-produced in that all project partners contributed to the development of the project aims and objectives and were involved in data collection, analysis and dissemination. The aims of the study were to examine pre-school children's use of apps and identify how far tablet apps for pre-school children (aged 0-5), including apps that incorporate augmented reality, promote play and creativity. The objectives were:

- To collect information about UK preschool children's access to and use of apps in the home.
- To identify the most popular apps for pre-school children and develop an understanding of the extent to which these promote play and creativity.
- To identify the factors that currently inform parents'/ caregivers' choices of apps for this age group.
- To examine the impact of apps (including augmented reality apps) on the play and creativity of pre-school children.
- To identify the affordances of apps that are particularly successful in promoting young children's play and creativity in order to inform: (i) future app development by the children's media industry and (ii) the future choices of apps for young children by parents/ caregivers and early years educators.
- To increase dialogue and promote knowledge exchange between academics, children's media industry, parents/caregivers and early years educators with regard to pre-school children's use of apps.

**The research questions that informed the study are as follows:**

(i) What home access to tablet apps do UK pre-school children currently have and how are they used?

(ii) How do variables including socio-economic status, age, gender and ethnicity impact on this access and use?

(iii) What are the most popular tablet apps downloaded by UK parents/ caregivers for pre-school children?

(iv) How far does children's use of selected popular apps promote play and creativity?

(v) How far do selected augmented reality apps promote play and creativity?

(vi) What are the affordances of tablet apps that effectively promote pre-school children's play and creativity?

(vii) What are the affordances of augmented reality apps that effectively promote pre-school children's play and creativity?

The study had four different Phases. In Phase One, an online survey of 2000 parents of 0-5 year-olds who used tablets was conducted. In Phase Two, observations and interviews were undertaken with children and parents in six families. In Phase Three, twelve children aged 3-5 were filmed using the apps that had been identified in Phase One as the top ten favourite apps in order to examine how far they promoted play and creativity. In Phase Four, an analysis of the apps was undertaken in order to identify what features supported play and creativity and which limited them.

# Survey Findings

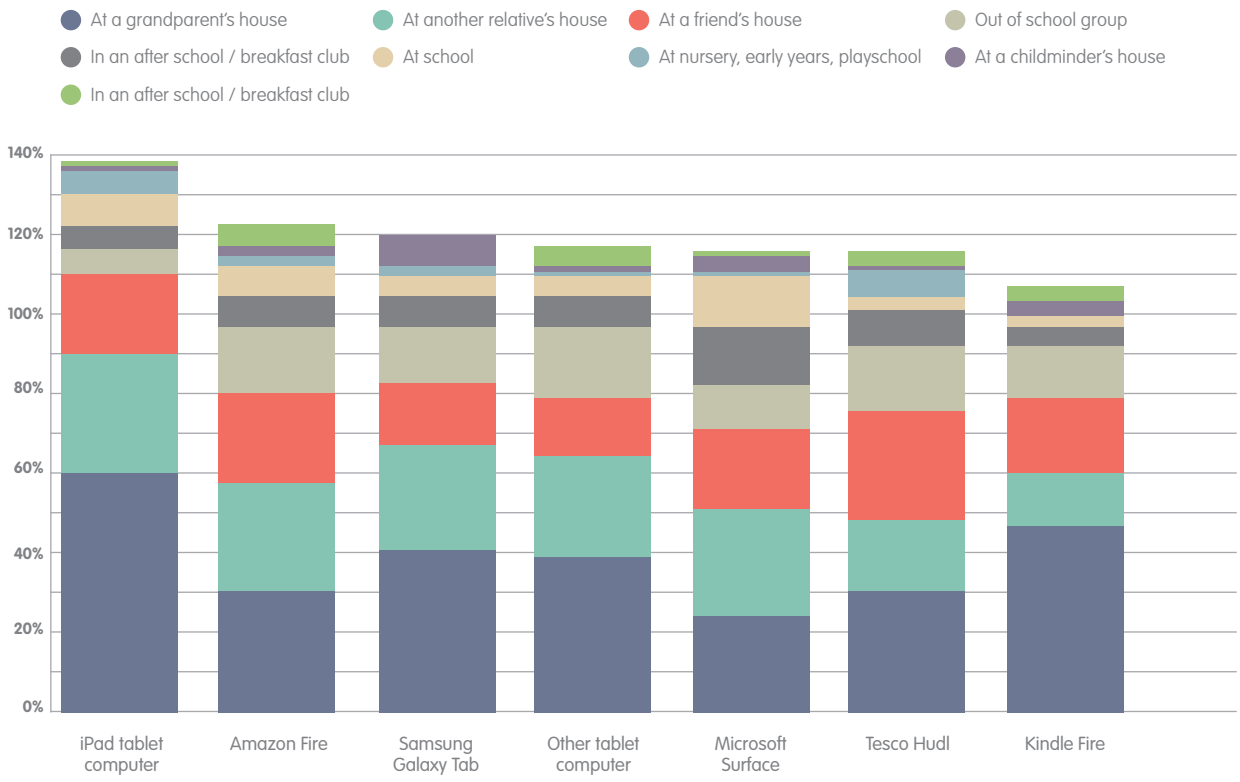
# 1. Access to and use of tablets

**Note:** In this report, we highlight the findings that may be of interest to early years practitioners. A fuller report of the project can be found on the project website: **www.techandplay.org**

All of the children in the survey had access to tablets at home as that is the population we were interested in surveying, but this is not the case for all children. Ofcom (2014) report that 65% of 3-7 year-olds live in a household with a tablet computer (Ofcom, 2015:23). Therefore, for those who do not have access to a tablet, it is important that they have access outside of the home. However, findings from our survey suggest that such access is not universal. Only 3% of parents reported that their children had access to tablets in early years settings. Most access outside of the home was at grandparents' or relatives' homes (see Figure 1).

## Tablet Access elsewhere

**Figure 1: Children's access to tablets outside of the home**




*Source: Dubit/University of Sheffield - February 2015. AQ2. You have indicated that your child can access the following devices elsewhere. For each device listed please indicate where your child accesses it? (Base 2000)*

## Tablet Use

Parents reported that their children under five used tablets for a mean of **1 hour 19 minutes** on a typical weekday and **1 hour 23 minutes** on a typical weekend day. As children watch television and play games on tablets, this use of the tablets reflects the convergence of media, with time spent on tablets replacing some of the time previously spent engaging with television screens. Patterns of use vary across the day. Use of tablets peaks between 4pm and 6pm each weekday, a time when parents are likely to be getting on with other tasks. At weekends, use is spread more evenly across the day. Tables 1 and 2 outline the patterns across a typical weekday and weekend day for 0-2s and 3-5 year-olds.

**Table 1: 0-2 year olds' use of tablets across a typical day**

| | | Time of Weekday | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Before 9:00am | 9:00am-12:00pm | 12:00pm-2:00pm | 2:00pm-4:00pm | 4:00pm-6:00pm | 6:00pm-8:00pm | After 8:00pm |
| Weekday | Activity | Collages, search engines | Collages | Magazines search engines | To help with education/ learning | Colouring in or looking at pictures | Making videos or watching videos | Making videos |
| | Motivation | Distraction or quiet time | | Encourage play and creativity | | | Distraction or quiet time | Distraction or quiet time |
| Weekend | Activity | Collages, search engines | Collages | Magazines search engines | To help with education/ learning | Colouring in or looking at pictures | Making videos or watching videos | Making videos |
| | Motivation | Distraction or quiet time | | Encourage play and creativity | | | Distraction or quiet time | Distraction or quiet time |

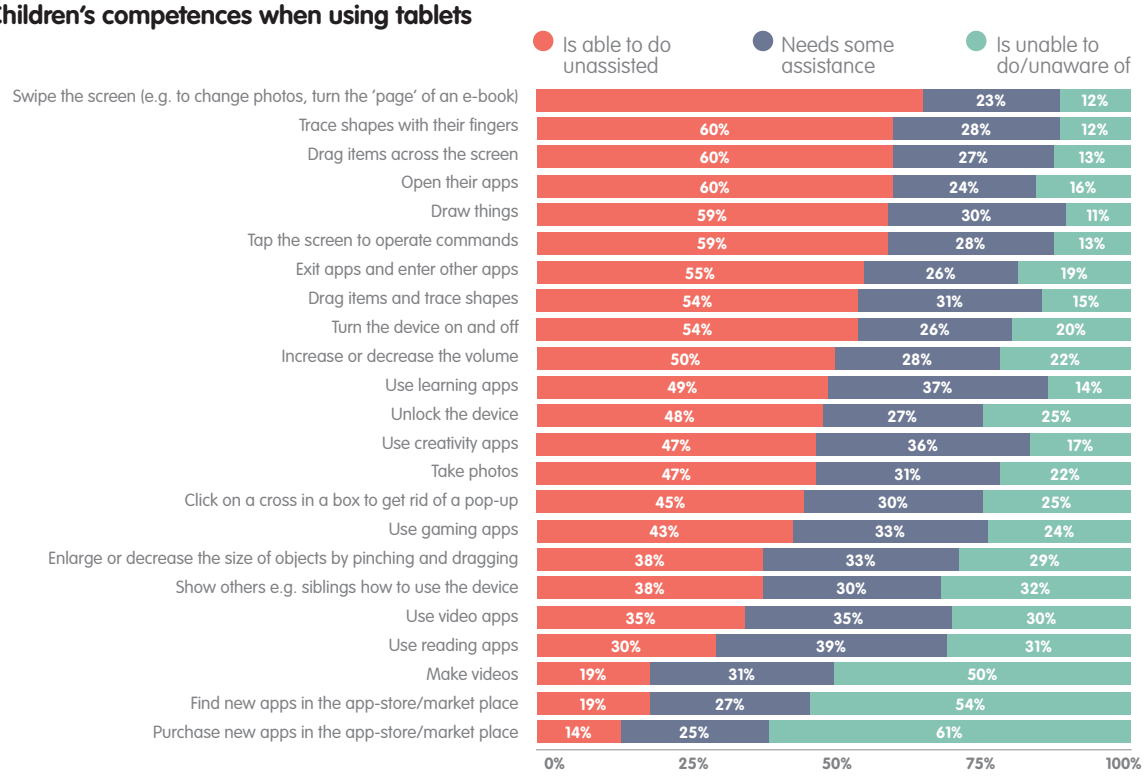
**Table 2: 3-5 year olds' use of tablets across a typical day**

| | | Time of Weekend | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Before 9:00am | 9:00am-12:00pm | 12:00pm-2:00pm | 2:00pm-4:00pm | 4:00pm-6:00pm | 6:00pm-8:00pm | After 8:00pm |
| Weekday | Activity | Magazines or collages | Magazines | Search engines or browsing internet | Browsing internet, Search engines or drawing | Playing with/use apps for gaming | Watching videos listening to stories or browsing internet | Browsing internet |
| | Motivation | Distraction or quiet time | Encourage play and creativity/ Educational purposes | | | | | Experience, encourage creativity and play |
| Weekend | Activity | Watch YouTube videos | | | Watch YouTube videos, play apps for gaming | Play apps for gaming | Watch YouTube videos, watching videos, stories/ audiobooks | Browsing internet |
| | Motivation | Distraction or quiet time | Encourage play and creativity/ Educational purposes | | | | Sit back, experience, encourage creativity and play | Bedtime stories, Sit back experience |

Children develop a range of competences when using tablets. Figure 2 identifies the key skills they develop:

## Tablet Use: Competence

### Figure 2: Children's competences when using tablets

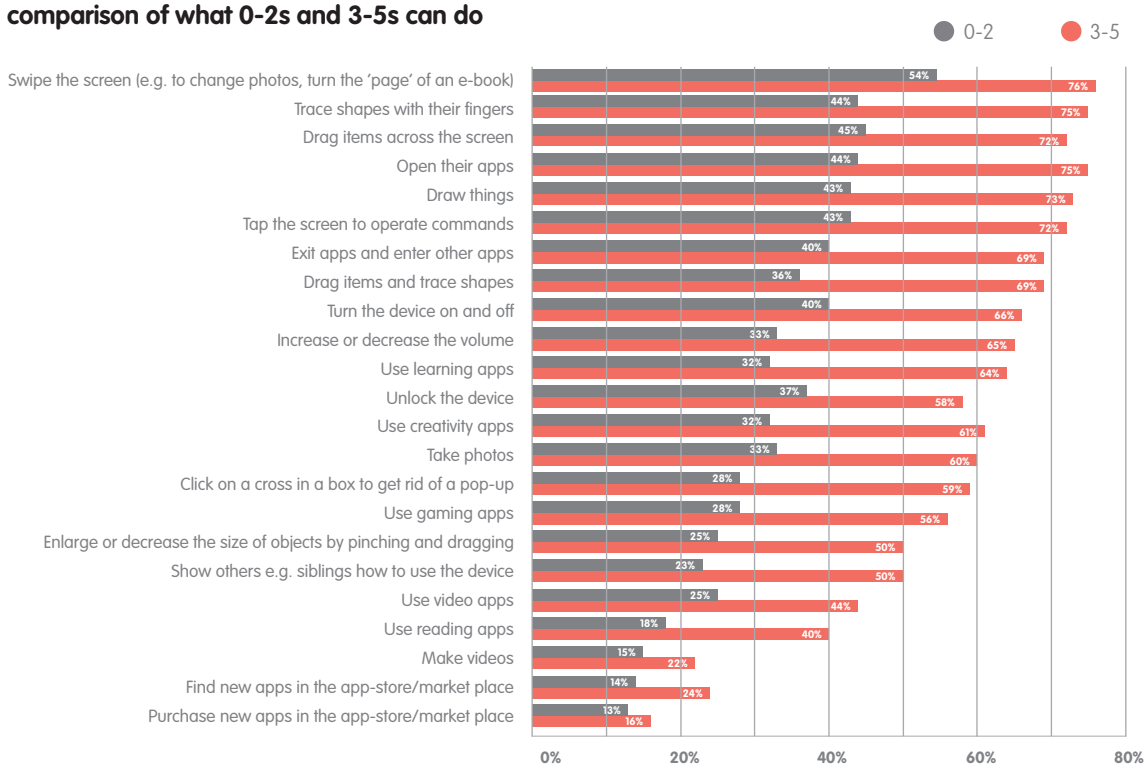



*Source: DQ1 We want to understand how comfortable your child is using a tablet. (Base 2000)*

Inevitably, these skills were age-related. Figure 3 indicates the differences in competences reported by parents of 0-2s and 3-5s

## Tablet Use: Is able to do unassisted

### Figure 3: A comparison of what 0-2s and 3-5s can do




*Source: DQ1 We want to understand how comfortable your child is using a tablet. (Base 2000)*

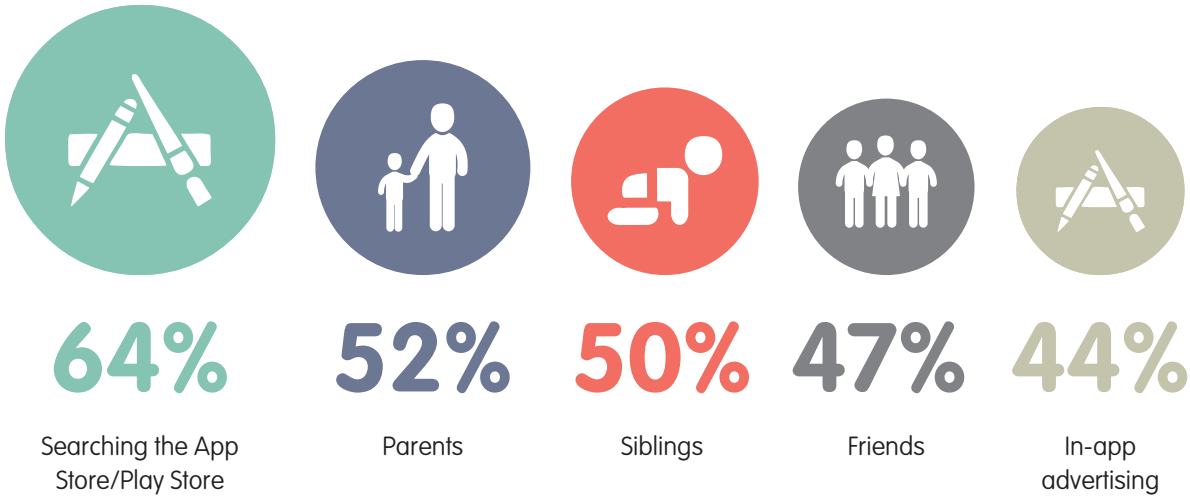
## Apps: Children's top ten favourites

Children's top ten apps were as follows:

*C-Q7. Please write your child's favourite five apps at this moment in time? (Base 2000)*

Children found out about new apps most often by searching the App/ Play Store (see Figure 4).

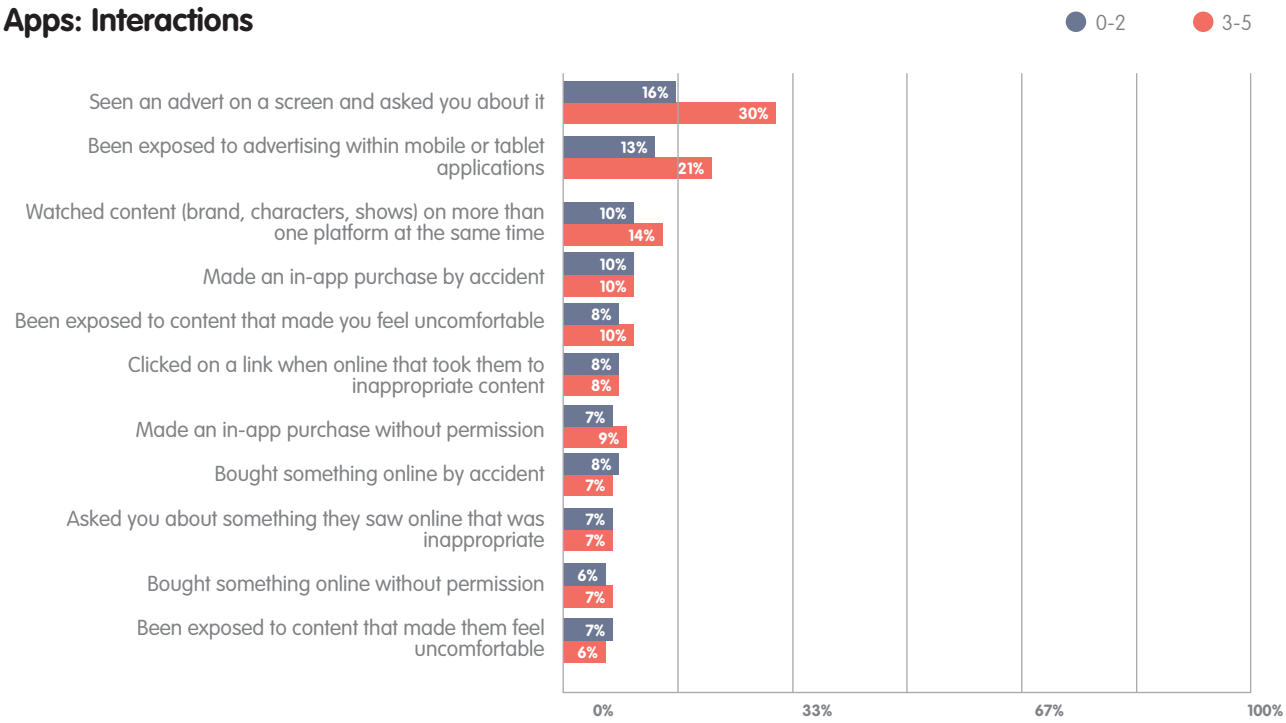
**Figure 4: How children discover new apps**




*Source: Dubit/University of Sheffield - February 2015. CQ8 Please rank in order of importance if there was more than one influence (please only rank the relevant options) (Top 3 rank) (Base 2000)*

Whilst negative experiences in the use of apps were minimal, nonetheless they point to the way in which some children have been exposed to content that made them feel uncomfortable (6%), been exposed to content that made parents uncomfortable (9%) or made an in-app purchase by accident (10%) (see Figure5):

**Figure 5: Children's experiences when using apps**




*Source: Dubit/University of Sheffield - February 2015. DQ2 Has your child ever? (Base 2000)*

In Phase Two of the study, the case studies confirmed many of the findings of the survey. Young children enjoyed using apps across a range of genres, and their favourite apps allowed them to watch videos, listen to music, play games, draw and paint, play games, create virtual worlds, look after pets, dress up avatars and engage in role play. Children like apps that relate to their popular cultural interests across television, films and iconic characters. Parents reported that they are more likely to be using tablets along with their children than children using them on their own although, for children who had learned to operate the tablet, this was in the form of close supervision more often than simultaneous use. Parents used a range of strategies for identifying good quality apps but mainly relied on App/ Play Store recommendations and the majority of apps downloaded were free.

In Phase Three of the study, children were filmed using the top ten apps identified in the survey in order to explore how far they promoted play and creativity. The majority of apps outlined promoted creativity and play, although the extent to which they did that differed according to the design of the app. The apps that were most successful at promoting play and creativity were apps designed specifically for this age group. Some of the apps (Angry Birds and Candy Crush Saga) did not promote a wide range of play and creativity. Talking Tom did offer opportunities for play and creativity, but very often, play sessions were interrupted by pop-up adverts and the encouragement for in-app purchases. Minecraft was only successfully used to promote play and creativity once children knew how to use it. As it contains no in-app help or scaffolding, it is not appropriate for children to first use this app on their own. In some cases, YouTube fostered a range of non-digital play and creativity following the vieiwing of videos. CBeebies Playtime and Storytime, Disney Imagicademy, Peppa's Paintbox and Toca Boca apps were all found to be appropriate for this age group and promoted a range of types of play and creativity.

Phase Four of the study enabled the identification of the features of apps that support play and creativity, outlined in the full report.

## Summary of Findings

Many children are inducted into the use of tablets from a young age and develop a wide range of competences and skills in their use. The tablet is their preferred form of technology. The data indicated that children's play and creativity can be fostered by apps, but this very much depends on the design of the apps, in addition to the personality and interests of individual children. However, some of the most popular apps provide limited opportunities for play and creativity and are not age-appropriate. Parents would welcome further guidance on choosing and using apps with their pre-school children.

# 2. Implications for early years practitioners

There are numerous ways in which early years practitioners might support pre-school children's use of tablets, both in the home and early years settings.

## Providing support and guidance to parents

First, offering advice to parents on which apps to download and how to use tablets would be valuable. Many early years settings offer guidance to parents on supporting children's early literacy through reading and writing, and this guidance could be extended to the use of tablets. If practitioners are unsure about the guidance to offer, then a starting point could be the information designed for parents and carers developed by this project and hosted on the project website (**www.techandplay.org**).

Share the names of the good quality apps you find with parents. At parents' evenings, distribute the list and have tablets about with the relevant apps on so they can try them.

Parental information sessions in which parents are provided with ideas about how to use tablets with their children would also be of value. There may well be some confident, 'tech-savvy' parents of children in your setting who would be willing to help, or you could contact your local early years training provider to see if any students could run a session with you. It is important that such sessions are hands-on, allowing parents to become comfortable with apps, and also include examples of how to interact with children when using apps.

## Choosing apps

There are so many educational apps aimed at pre-schoolers that it can be confusing for practitioners to decide on which apps to use. The following questions offer a starting point:

- Is the app designed for a pre-school audience?
- Is the app produced by a company that has an established catalogue for this age group?
- Are the aims of the app clear?
- Does the app allow practitioners to set levels of challenge?
- Is the app easy for children to navigate? For example, is the home page clearly visible? Is the use of written text limited?
- Does the app offer guides for children in how to use it e.g. arrows that point to what to tap, or a voiceover that tells children what to do if there is a long pause?
- If the app is an e-book, does it highlight words as they are read by a narrator?
- Are pop-up adverts and in-app purchases absent or limited in number?
- Can children add their own features into the app e.g. by taking photographs that appear in the app, inserting drawings etc.?
- Are children rewarded for effort e.g. by characters cheering, badges and so on?
- Does the app promote play and experimentation, rather than focus on a narrow set of skills?
- Does the app challenge children to solve problems and speculate about possible alternatives?
- Does the app prompt children to ask questions and reflect on their actions?

There are numerous guides on choosing apps for pre-schoolers. In addition to sites[1] aimed at a general audience, including parents, there are sites[2] that provide teachers with guidance on choosing apps. Share your recommendations for other early years practitioners on your setting's blog or twitter feed – in that way, collective knowledge can be developed on apps that are useful for this age group.

[1] See:
www.commonsensemedia.org/app-reviews
www.appsplayground.com

[2] For example:
www.iteach-uk.com/resource/fantastic-apps
www.apps4primaryschools.co.uk
www.uk.pinterest.com/helencaldwel/apps-for-eyfsks1/
www.enabling-environments.co.uk/recommended-apps/

# 3. Using tablets in pre-school settings and early years classrooms

In this short guide, we outline a few key principles for using tablets and draw on good practice undertaken by teachers in Monteney Primary School, Sheffield, who were partners in our project. We consider how tablets and apps can support play and creativity, as they were the focus of the project. In each area, we identify the key skills these activities can develop, which relate to early years curricula in the UK, but which are also relevant in an international context.

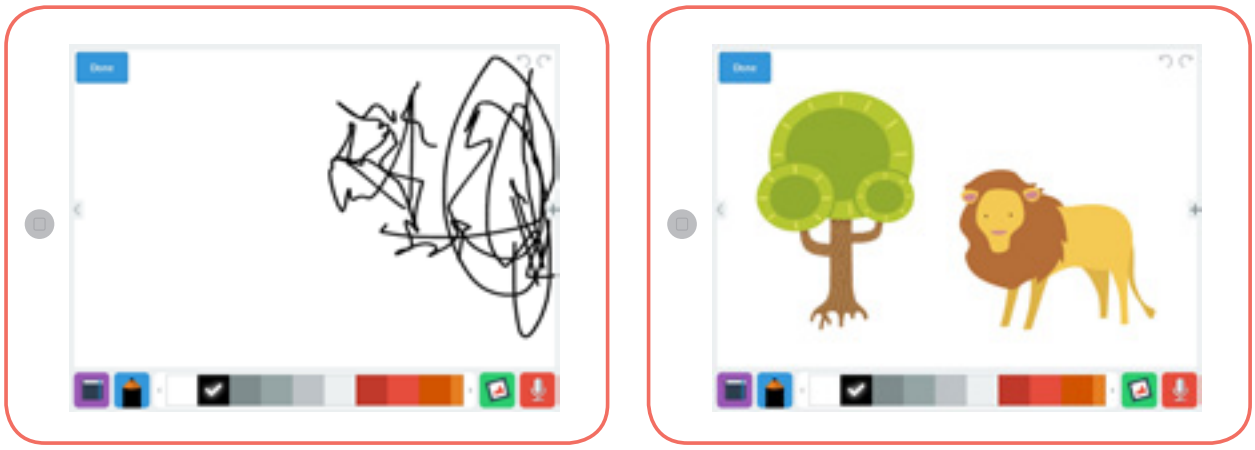
## Creativity

Not all children have extensive opportunities to be creative with tablets at home if they are limited to apps that are not designed for pre-schoolers, or apps that are not very interactive. Therefore, it is even more important that early years practitioners develop ways in which children can use the tablet creatively. There are a range of ways that this is possible and some approaches are outlined below.

### Creating Stories

One of the most useful starter apps for creating stories is *My Story*. The app is simple to use as children can insert photographs and text with the use of easy-to-follow icons. Children can create their own drawings or use image clips embedded in the app (see Figures 6 and 7).

**Figure 6 and 7: My Story Screenshots**



Text can then be added to the drawings/ images. Stories, once completed, can be created as short movies. These could then be shared on a blog, or Twitter stream.

Another useful app for story creation is *Our Story*.

There are apps that foster story-telling through the use of puppets such as *Puppet Pals*. Children can choose characters and settings and create storyboards and films. With the app *Sock Puppets*, children choose a character and can create a lip-synched video.

**Key skills developed**

language skills; expressing ideas, thoughts, feelings; choosing and using still images; creating films; presenting/ performing for audiences.

### Drawing and Painting

There are numerous drawing and painting apps available that are appropriate for children in the early years and some of the best for young children include *Brushes*, *Doodle Buddy*, *Drawing Pad* and *Sketches*.

Apps that replay how children's drawings were created encourage reflection. Apps such as *Draw and Tell* and *Sago Mini Doodlecast* enable children to create a picture and talk about it. This can be used to create information texts as well as stories.

If your setting has an interactive whiteboard, share children's outputs in a slideshow and children can be encouraged to discuss each other's work.

**Key skills developed**

Choosing ways to create images using line, shape, form, colour, tone, pattern and texture; use of visual elements to express feelings and thoughts.

### Video-production

It is easy to make videos using the camera function on the tablet, although for small children, holding the tablet during video production is a challenge. It is possible to purchase tablet tripod mounts, which may help. There are also apps that enable children to create animated films, such as *iStopMotion*, which is simple to use and allows children to create animations from a series of still photographs.

**Key skills developed**

Communicating thoughts, feelings, ideas and information through moving image; making choices about modes.

### Photography

As we found in our study, many children develop skills in taking photographs using smartphones and tablets from a young age. Therefore, the key task for early years educators is to ensure that children are critically reflective about the photographs they take and are able to use them creatively in a range of ways. Apps that enable children to create collages using photographs include *PicCollage* and *Moldiv*.

In Monteney Foundation Stage 2 class, *PicCollage* is used to record children's activities, allowing them (or practitioners) to annotate their creations (see Figure 8.)

**Figure 8: PicCollage used to record activities**

The *Padlet* app links to a web page on which children can post notes, photographs and videos. It can be used to create a collective account of a topic or visit.

*News Booth* is another useful app that can be used in imaginative ways with photographs. It enables users to create news headlines (adults would need to support young children in the writing of headlines). (See Figure 9.)

**Figure 9: Using News Booth app**

**Key skills developed**

Communicating thoughts, feelings, ideas and information through still images; developing critical skills.

### Music

There are numerous apps that enable children to play along with nursery rhymes and songs, such as *Little Fox Music Box and Tap a Tune*. Apps that enable children to create their own compositions include Jelly Band, *Percussive Free, Toca Band* and *Tune Train*.

A number of apps link the visual and aural in ways that are engaging for pre-schoolers. These include Beatwave, Falling Stars, Loopesque Kids and Singing Fingers.

**Key skills developed**

Exploring rhythm, sound and dynamics; communicating ideas, thoughts and feelings through music; structuring melodies.

### Coding

There are a number of apps that are helpful for children learning to code. The *Bee-Bot* app builds on the popular floor robot of the same name and allows children to program a virtual *Bee-Bot* across 12 levels. Kodable challenges children to program furry aliens, known as Fuzzes, to explore the planet Smeeborg. With support, some children could use *ScratchJr*, developed by the same team that created *Scratch*, which has been successful in teaching older children to code.

Of course, like many other areas of learning, developing young children's understanding of complex areas through more concrete, physical experiences can help. Reception class in Monteney, for example, followed directional instructions to manouevre a wooden plane (see Figure 12).

**Key skills developed**

Problem solving; logic; mathematics; data representation.

**Figure 12: Early coding activities**

### Note

Coding is an activity that needs to be embedded into meaningful, creative activities if it is to be appealing for young children. Rather than learning to code for the sake of it, embed the need to code in fun activities that relate to the cross-curricular topic or theme that informs medium-term planning.

## Augmented reality apps

In the project, children were observed using a range of augmented reality apps. Some of these apps fostered creativity, and are outlined below.

*AR Flashcards* – This app enables children to aim the tablet at pictures of animals, linked to a letter of the alphabet, which then appear in 3D. Whilst this in itself does not consist of children creating something new, it does prompt imaginative play and is motivating for children.

*Aurasma* – This app enables children to tell a story/ outline information on video camera and then link their story to a drawing/ photograph/ artefact. The app links the two outputs and then, when the tablet is pointed at the drawing/ photograph/ artefact, the video appears.

Monteney Primary School held an exhibition in which children's augmented reality stories created with Aurasma were displayed for parents to interact with. Children created their own superhero comic strips and orally retold their story. Teachers recorded a video of some of the children telling their stories and used their comic strip storyboards as a trigger photo for the app.

*Meet the Animals* – These are books that introduce children to sea creatures or animals through drawings and poems. The tablet is pointed at the picture and the picture appears as 3D and the poem is read out by a narrator. Children can then complete virtual jigsaws of the animals.

*Quiver* (formerly ColAR) – This app enables children to colour in drawings that are then brought into 3D life with the tablet (see Figure 10). Whilst the app might foster language and spark the imagination, it is not possible for children to create their own drawings with the app.

**Augumented reality = The layering of digital information on a physical environment/ artefact**

*Squigglefish* – This app imports pictures children have drawn into an underwater scenario. Their drawing of a fish/ mermaid/ whatever they wish then floats about amongst the seaweed. The app could promote oral storytelling (see Figure 11).

**Figure 11: Squigglefish screenshot**

**Figure 10: Bringing characters 'to life'**

**Key skills developed**

(vary according to app used): language skills; phoneme-grapheme correspondence; communicating ideas, thoughts and feelings; knowledge and understanding about the world.

## Play

The full report on this study outline the range of types of play that apps can foster. However, tablets can also support play in a number of other ways in an early years setting.

First, let children have a tablet to use in role-play scenarios that are set up in socio-dramatic/ role-play play areas. Almost every scenario would lead to potentially creative uses of the tablet:

- Doctors' surgery – the tablet could be used to manage appointments, input patients' information and take photographs of injuries.
- Supermarket – the tablet could be used for stock checks, taking customers' orders and creating adverts.
- Airport – the tablet could be used to check passports, find out flight information and make public service announcements.
- Newsroom – the tablet could be used to create a timetable for the production of the news, make notes on stories and create news items (using the video camera, or the 'Newsroom' app).

Second, the tablet can be placed in areas around the room in order for children to record aspects of their play using the video camera, for example in small-world play, water play and sand play.

Third, taking the app into the outdoor area can encourage its creative use. Could a teddy be taken outside and the camera used to record its adventures? This could be followed up by using the photographs for story creation.

At Monteney Primary School, children in Nursery used tablets that interacted with QR Codes to solve a puzzle. The QR codes were linked to a website that allowed the children to follow clues in order to find the Big Bad Wolf before he ate all their Easter eggs! (See Figure 13.)

**Figure 13: Using QR codes in outdoor spaces**

## Conclusion

Tablets can foster children's play and creativity in a range of ways in early years settings, as outlined in this booklet. They are particularly valuable for enabling collaborative work, as a number of children can interact with the screen at the same time (whereas devices that depend on a mouse can lead to one child dominating use).

For those of you interested in reading further about the subject, we outline a list of both academic and professional texts in Appendix 1.

The 'Exploring Play and Creativity in Pre-Schoolers' Use of Apps' project has been successful in identifying how apps can support parents and teachers in fostering children's engagement and promoting learning through the use of tablets. We would like to hear from early years practitioners about the ways you have used apps productively in early years settings – please use the feedback form on our website to communicate with us!

**www.techandplay.org**

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# Appendices

# Appendix 1

## Project Partners

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# Appendix 2

## Recommended Reading

### Professional Publications

Caldwell, H. and Bird, J. (2015) *Teaching with Tablets*. London: Learning Matters.

Faulder, M. (2015) Enabling *Environments: IPads in the Early Years*. (Available as an iBook in iTunes).

Huang, S.; Clark, N., and Wedel, W. (2013). Teaching tips: The use of an iPad to promote preschoolers' alphabet recognition and letter sound correspondence [online]. *Practically Primary*, 18(1): 24-26.

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Kucirkova, N. (2014) *iPads and Tablets in the Classroom: Personalising children's stories*. UKLA (http://www.ukla.org/publications/view/ipads_and_tablets_in_the_classroom_personalising_childrens_stories/0)

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**Research Publications/ Reports**

Blackwell, C. (2013). Teacher practices with mobile technology: integrating tablet computers into the early childhood classroom. *Journal of Education Research*, 7(4), 1-25.

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