

EARLY LEARNING IN THE
DIGITAL AGE

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PART I

PLAY AND
LEARNING IN
A DIGITAL
AGE



1

CHILDREN'S PLAYFUL ENCOUNTERS WITH IPADS

ADERONKE FOLORUNSHO AND
IOANNA PALAIOLOGOU

CHAPTER OVERVIEW

A plethora of research evidence suggests that digital technology has become a major part of the lives of children and that many homes in developed countries are digitally fluent (e.g. Edwards et al., 2017; Palaiologou, 2016; Plowman, 2015). There has been a dramatic increase, especially in tablet use by children (Dunn et al., 2016), which has overtaken television as children's first choice of digital entertainment (Livingstone et al., 2014). Although we know a great deal about what happens in home life and the inclusion of technology in everyday activities (Plowman, Stephen and McPake, 2010), research on how early childhood education can use these devices is still emerging (Fleer, 2017; Yelland, 2015, 2016). Thus, this chapter, based on a mixed methods study that was conducted in English early childhood education, discusses children's playful

encounters with technology and, through observational case studies, explores how children interact with digital devices in their everyday life.

This chapter aims to help you understand:

- what research defines as digital play
- how children interact with digital devices
- how children develop their play with digital devices
- implications for early childhood education.

DIGITAL PLAY

The presence of technologies in children's daily lives has led to the term 'digital play' being introduced to characterise the ways children engage with digital devices (e.g. Bird and Edwards, 2015; Stephen and Plowman, 2014). An emerging body of research, as it will be seen throughout this book, also examines children's digital profiles and the nature of these interactions/encounters to see whether they are playful (Marsh et al., 2016), contribute to children's playful experiences (Arnott, 2016; Danby et al., 2017; Miller et al., 2017) and 'extend play to include them in the repertoire of play experiences' (Yelland and Gilbert, 2017: 33). Some researchers (e.g. Stephen and Edwards, 2018) go further by arguing that traditional views and theories of play are not connected with the use of digital technologies and identify the need for research on 'an alternative theory of digital play' (p. 85). Although there is research that examines traditional play (e.g. Brooker et al., 2014; Wood, 2015) and how it provides a platform for learning for young children, the nature of digital play as a 'new' type of play has not been examined in full. Despite the research, it still seems that early childhood educators are concerned about what digital play entails (Huh, 2017) and whether it has any educational value (Palaiologou, 2016).

The term 'digital play' has been used to describe the range of activities children engage in with digital technology (Kline et al., 2003) and its inclusion in play (Howrey, 2016; Kucirkova, 2017) these digital devices comprise touchscreens (smartphones, tablets) and applications of digital content, video games and internet-connected toys. Regardless of the emerging field of research, some believe and argue that digital play is not real play (Palmer, 2015) and that such technology may cause a decline in spontaneous forms of play (Ferguson, 2015; Kabali et al., 2015; Nathanson, 2015; Radesky et al., 2015). Despite these beliefs, emerging research is beginning to shed light on how children's engagement with digital technology can be viewed as play (Arnott, 2016; Danby et al., 2017; Edwards, 2013; Fleeer, 2017; Holloway et al., 2016; Marsh et al., 2016; Slutsky and DeShelter, 2017; Stephen and Plowman, 2014). This body of evidence is significant for early childhood educators because it will help them understand how digital play occurs (Bird and Edwards, 2015; Edwards and Bird, 2017).

Typically, research on children's digital play uses descriptors or types of play associated with non-digital play to frame children's digital engagements. Marsh et al. (2016), for example, examined how apps promote play and creativity by adapting Hughes' (2002) taxonomy of play to their research. The study showed that 'traditional' characteristics of play could be applied in a digital context. They argued that what changed when the children engaged with digital technology was not the type of play, but the context in which the play occurred, meaning that play occurred in a digital context. The characteristics of play did not change because the mode of play changed. Types of play such as symbolic, creative, role, socio-dramatic and collaborative were evident in a digital context (Sullivan and Bers, 2016; Zaman et al., 2016). Yelland (2015, 2016) used the term 'playful explorations' to describe children's engagement with digital technology and proposed that these are about making digital and non-digital activities available for children. She argued that isolating digital activities is not the way forward if we want to understand how digital play occurs. Thus, she urged for the provision of 'contexts so that young children can experience different modes of representations which in turn afford them the opportunity to formulate new understandings about their world' (Yelland, 2015: 235).

To conclude, emerging research argues that the nature of play has not changed but digital activities have changed the context. This identifies the need for more research on what happens when children engage with digital play, as new research shows that children's play is blended between digital and non-digital activities (Bird, 2017; Nuttal et al., 2015; Plowman, 2015; Yelland and Gilbert, 2017). Thus, the research presented by us in this chapter aimed to examine:

- what types of playful encounters occur when children are interacting with digital applications
- what characteristics such encounters entail.

REFLECTIVE TASK

Reflect on the use of digital technology in your life. How do you use technology? Can you identify activities that you can classify as your digital enjoyable time?

THE RESEARCH CONTEXT

This is a small-scale research study conducted in one early childhood setting in southern England within a period of six months (for information on the English context, see Chapter 4). The methodology employed was mixed methods. In this chapter, we report the qualitative findings from:

- semi-structured observations that aimed to collect data about the specific context within which the play encounters with technology were happening
- participant observations.

Over the study period, 168 observations were collected and analysed thematically.

The study focuses on children's interactions with iPads. Prior to the research, the setting was not using mobile technology, such as tablets, and had only a desktop computer that children were using with an adult at certain times during the week for educational activities, such as learning phonics. The iPad was introduced to a class of five boys and nine girls aged 3–4 years as another 'toy' in the class and not something that could be used at certain or fixed times during the day. During play times, the children could pick it up and use it as they would have done with any other toys in the class. After negotiations with the practitioners and for ethical reasons, the iPad was offered offline to children, with the most common applications available being related to literacy and numeracy, although there were also puzzle and painting apps such as Peppa Pig Shopping, Endless 123 and Disney Junior.

To choose the applications, we reviewed a number that were available for young children up to 6 years of age. The choice of applications for this research study was based on six categories of criteria and questions, presented in Table 1.1, that can be used to assess and select digital activities for children. The work of Hillman and Marshall (2010) guided us as to which applications were to be used in agreement with practitioners and parents.

Table 1.1 Criteria for choosing the applications

Domain	Central question	Criteria questions
Interactivity	Is the role of the child integral to the activity?	<ul style="list-style-type: none"> • Does it allow the child to actively participate? • Does it promote critical and creative thinking? • Does it model decision making and positive problem solving?
Digital literacy	Does it increase the child's familiarity and ability with technology?	<ul style="list-style-type: none"> • Does it help the child make sense of the world? • Does it teach the child to explore?
Appropriateness	Is it targeted at young children?	<ul style="list-style-type: none"> • Does it allow the child to experience multiple domains? • Does it contain significant content and outcomes? • Is the digital experience challenging, but not frustrating? • Does the digital world present a positive virtual universe?
Results	Does it provide knowledge of results a child can understand?	<ul style="list-style-type: none"> • Is there a clear and understood connection between the child's actions, learning responses and the programme (app)'s results? • Is feedback incorporated regularly to guide the child's performance rather than as a display of success/failure or win/lose decision at the end? • Is the feedback easy to interpret?

Domain	Central question	Criteria questions
Participation	Does the programme encourage participation (collaboration) amongst children, parents and teachers?	<ul style="list-style-type: none"> • Are there programme components that provide parents, caregivers and teachers with information on the programme's goals, ways to participate, the child's experiences and ways to evaluate the child's experiences? • Is the learning experience enhanced when parents, caregivers or teachers participate with the child?

Source: Hillman and Marshall (2010)

Subsequently, the applications in Table 1.2 were selected.

Table 1.2 Digital applications selected in the study

Peppa Pig Shopping	Bird Collection Puzzle	Alphabet Tots
Literacy	Peppa's Paint Box	Puzzle 123
Max and Ruby	Tonia Colour Book	Endless Reader
Hooked Phonics	Lego Game	Pixie Dust Lite
Edu Kids Room	Disney Junior	Endless 123
Tiggly Chef	The Garden	Nursery Rhymes
Art Studio	Not Like the Others	Wild Habitat
Endless Word Play	Stumpy	Play Kids
Animal Puzzle	Leo's Pad	Lumi Kids
Elmo 123	Edu Math 1	Disney Digital Books
Mini School	Mr Potato Head	Bugs and Numbers
Cardtoons	House Hunt	Turtle Math
Addition	Critter Math	Farm 123
Funbrain Jr	Road Trip	Colour Book
Monsters	Fit Brains	Monkey Birthday Party

REFLECTIVE TASK

Reflecting on the criteria presented in Table 1.1, download an application designed for young children and critique it by applying the criteria in the table. How will you rate the interactivity, digital literacy, appropriateness, results and participation? To what extent and in what ways do you think this application can enhance children's play?

TYPES AND CHARACTERISTICS OF DIGITAL PLAYFUL ENCOUNTERS

The result of the observations when children were engaged with applications demonstrated many playful characteristics similar to other studies (e.g. Kucirkova, 2017; Kucirkova et al., 2014). We found that when children engaged with the applications, behavioural, cognitive, emotional, social and physical playful encounters were present. We also found that children disengage with the iPad to move on to other activities. The types and characteristics of children's playful encounters with the apps that emerged from the observations are presented in Table 1.3.

Table 1.3 Types and characteristics of digital playful encounters with the applications

Types of encounters	Characteristics
Behavioural engagement	<ul style="list-style-type: none"> Involvement Persistence Assertiveness
Cognitive engagement	<ul style="list-style-type: none"> Use of language Problem solving Symbolic representation Creating and constructing Categorising Selective attention Recalling Active listening Working memory Exploration Classifying
Emotional engagement	<ul style="list-style-type: none"> Happiness Enjoyment Frustration Empathy
Social engagement	<ul style="list-style-type: none"> Peer engagement Give-and-take and interchange activities (reciprocal) Cooperation

Types of encounters	Characteristics
Physical engagement	Adult interaction
	Conflict with peers
	Negotiation: Theme and topic of the activity Roles Use of objects (including apps)
Disengagement	Fine motor skills
	Muscular and postural engagement
	Distraction
	Absence of effort
	Withdrawal

The features of the iPad (i.e. mobility) and the applications (i.e. colour, interactivity, movement) influenced the children's playful encounters. The applications had interactive backgrounds that were bright and colourful and drew children's attention; the children were further attracted by the music playing in the background to each app. These apps had menus that helped the children to navigate to different tasks within the game. This made it easy for them to understand how to navigate the digital activities because they were usually large and colourful. The children also enjoyed getting feedback whenever they completed a task, as is illustrated in the Peppa Pig case study (1.1).

CASE STUDY 1.1: MAX PLAYS PEPPA PIG

Toby and Max are playing with the Peppa Pig app. The app includes a shopping cart and the children need to navigate it around to do their shopping before moving to the next level. Max holds the iPad and is looking out for the items he needs. He sees on the screen an item in his shopping cart that is not part of the items in his shopping list.

Max: 'I don't need that.'

Toby: 'Then tap on the shopping cart and swipe it out.'

Max taps on the shopping cart and swipes the item out.

(Continued)

(Continued)

Max: 'No, Daddy Pig, don't do that!', he says when the pig on the app puts an item not on Max's list into the shopping cart. After playing a while, he finds all the items he was supposed to collect from the list.
 [talking to the screen]
 'Good job', says the voice in the game and triumphant music plays.
 Both boys give a big smile and say: 'We did it!'

In this instance, Max takes on the role of shopper, tapping on a number of items on the shelves as his avatar Peppa Pig passes them by; this is a playful encounter that can be classified as an 'enactment of real-life scenarios in a digital environment that are based on personal experiences and this can take place through avatars for example going shopping' (Marsh et al., 2016: 6).

Also, there were many instances of creative problem solving during play where the children explored and developed ideas and pictures in a digital context when using Peppa's paint box and Leo's pad, as in case study 1.2.

CASE STUDY 1.2: ADAM'S VIRTUAL LAVA DRAWING ON THE PEPPA PIG APP

Adam taps on George (one of the characters in the app). He moves his finger to the menu and taps on the red paint bucket. He uses his fingers to spread the red paint all over the screen.

'I'm making lava', he says.

He moves his fingers towards the menu icons and taps the blue paint bucket. He uses his fingers to spread the blue paint across the screen. He does the same with black paint. (See Figure 1.1)

'George is afraid of the dark', he says as he paints.

Peppa's paint box was a favourite digital activity when it came to painting. This app was one of the activities that occurred often in the observations. This showed that the children

transferred their interest in drawing and painting to the digital activity that provided them with a stimulating environment without them getting paint on their fingers or having to wear an apron. Furthermore, they could delete their picture and start again if they chose to.

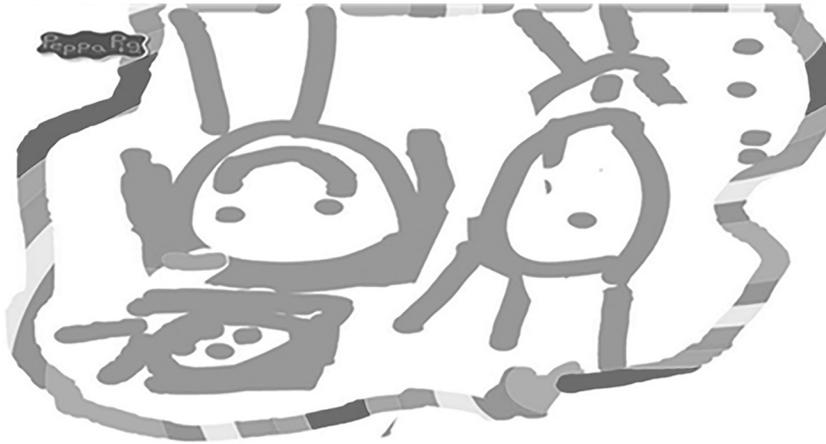


Figure 1.1 Adam's virtual painting

There were also situations where imaginative play in a digital context was observed, as in the examples in case study 1.3.

CASE STUDY 1.3: SARAH PLAYS TIGGLY CHEF

Sarah taps on Tiggly Chef. The game starts and she taps on five bananas, one cherry and five eggs. She is using her right index finger now to tap the ingredients into the bowl. Sarah laughs and looks at the researcher. She appears to enjoy playing the game with the iPad. She makes the chewing sound as she taps on the food prepared. The game ends. She starts the game again excitedly.

'Strawberry', she says excitedly as she taps on two strawberries in the bowl.

She makes a munching noise as she taps on the food prepared.

'I ate it all up', she says happily.

(Continued)

(Continued)

In this instance, Sarah was engaging with activity on the app and pretending that she was eating the food she was preparing virtually. We can see the activity encouraging pretend and imaginative play in a digital context whereby the children made use of their imaginations. This shows that imaginative and pretend play can occur with digital activities as well as non-digital activities. iPads and digital activities can be resources, therefore, that children can use to meet their play needs (Arnott, 2016). The application that Sarah interacted with was a numeracy activity which allows children to learn how to count using food ingredients. Sarah was able to tap on the food ingredients whilst the Chef (on the app) counted the numbers out. Then Sarah went further by imagining that the food was real, and pretending to eat it. Therefore, the intended purpose of the digital activity was achieved. Imaginative play can also occur when children use toy people, animals, cars and houses to create imaginary worlds. In these worlds, they act out stories that they are familiar with or make up new stories or situations from their imaginations. They are in control of the storyline and make and break the rules.

The applications chosen encouraged imaginative play and problem solving, whereby the child was engaging with the virtual characteristics such as the animals getting to a picnic by passing through some hurdles. The applications 'acted as digital placeholders and digital pivots to enhance play' (Fleer, 2017: 303). However, in an earlier study, Stephen and Plowman (2014) caution that digital activities such as these may provide initial motivation and engagement for play and learning but only for a short period of time. They go on to suggest that digital technology specifically created for children should be more open-ended and flexible so that it can easily respond to children's changing interests and relate to their authentic experiences.

REFLECTIVE TASK

After exploring an application for children from the list in Table 1.2, consider what are its advantages and disadvantages. In your practice, how can you use it with the children to amplify their play?

CONCLUSIONS

In our study, we found that when engaging with digital activities children exhibit playful encounters that they also exhibit in non-digital play. As Marsh et al. (2016: 250) suggest, 'what changes in digital context is not so much the types of play possible, but the nature

of that play'. The examples provided here illustrate the playful encounters children can have with digital devices in early childhood education. The digital activities provided opportunities for the children to communicate with each other, be creative, self-initiate their interests and be cognitively engaged. Digital activities can provide play opportunities for children in the same way that non-digital activities do. Thus, as elsewhere in the literature on digital play, early childhood education should:

align and integrate technology and media with other core experiences and opportunities. Young children need tools that help them explore, create, problem solve, consider, think, listen and view critically, make decisions, observe, document, research, investigate ideas, demonstrate learning, take turns and learn with and from one another. (NAEYC and Fred Rogers Center, 2012: 6–7)

The digital applications that children had access to in this project became a platform for their play and offered them opportunities to engage in artistic pursuits such as drawing or imaginative play, such as cooking and eating, where 'efforts and process are more important than the product' (Eliason and Jenkins, 2012: 355) as 'they experience being the one who makes or decides something' (Branscombe et al., 2014: 30).

SUMMARY

In this chapter, we presented a small case study of the playful encounters of children with applications using the iPad. We demonstrated that when engaging with digital activities children exhibit characteristics of play similar to the ones that have been described elsewhere in the literature of non-digital play. The applications amplified children's play and became 'digital placeholders and pivots', where children engaged behaviourally, emotionally, socially, cognitively and physically.

KEY POINTS TO REMEMBER

- Although there is still a body of opinion that claims digital devices do not have a place in early childhood education, we argue that they can become part of the resources valuable to children in their daily life.
- Digital devices can offer children another playful platform where their play is taken in a different context.
- Early childhood education cannot ignore the integration of technology as part of children's playful landscapes, which can become a valuable toy amongst other non-digital toys.

POINTS FOR DISCUSSION

- Reflecting on the curriculum framework you are working within in your practice, discuss what digital devices you could integrate in your daily routine, for what purposes and how you could use them.
- Consider what type of training staff in early childhood education might require in order to amplify children's play in the digital age.
- Consider what might be the advantages and disadvantages in your own context of integrating a variety of digital devices.
- Technology is developing rapidly and children are now moving to more tangible technologies such as internet-connected toys. Read the following article: Marsh, J. A. (2017) The internet of toys: a posthuman and multimodal analysis of connected play. *Teachers College Record*, 119: 1–32, and consider what implications this development in technology might have for your early childhood practice.

FURTHER READING

Danby, S., Davidson, C., Theobald, M., Houen, S. and Thorpe, K. (2017) Pretend play and technology: young children making sense of their everyday social worlds. In S. Lynch, D. Pike and C. Beckett (eds) *Multidisciplinary Perspectives on Play from Birth and Beyond*. Singapore: Springer, pp. 231–245.

Harwood, D. (2017) *Crayons and iPads: Learning and Teaching of Young Children in the Digital World*. London: Sage.

As technology is changing rapidly, the following two articles examine the role of internet-connected toys and how children engage with these:

Holloway, D. and Green, L. (2016) The internet of toys. *Communication Research and Practice*, 2 (4): 506–519.

Yelland, N. (2018) A pedagogy of multiliteracies: young children and multimodal learning with tablets. *British Journal of Educational Technology*, 49 (5): 847–858.

USEFUL WEBSITE

<http://digilitey.eu> – this website is based on an international project examining how children may use technology effectively. It includes reports, current research and lists of relevant publications.

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