

# Childhood in the digital age



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# Introduction

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Are you a technology optimist or a technology pessimist?

The amount of technology available to children today is greater than in any previous generation, and it is more specifically designed to capture their imaginations. There is heated debate as to how the digital influx is shaping children's development and experience.

Are social media changing the way that children form relationships? How is technology changing the way that children think, and how will it shape the classroom of the future? This exciting new free course pulls together the latest evidence from experts in the field to explore these and other questions.

Join us as we delve into the lives of children and discuss the potential benefits and limitations of technology in their lives.

The course is intended for anyone with a general interest in childhood studies, early childhood, education studies and child psychology and does not require any prior experience of studying this subject.

# Learning Outcomes

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After studying this course, you should be able to:

- describe the range of digital technologies used by children
- list the main concerns that have been raised about harmful effects of digital technologies on children's development
- discuss differences among types of digital technology
- evaluate arguments for and against digital technologies being beneficial for children's development
- suggest ways in which children can be helped to benefit from engaging with the digital world and to avoid the risks.

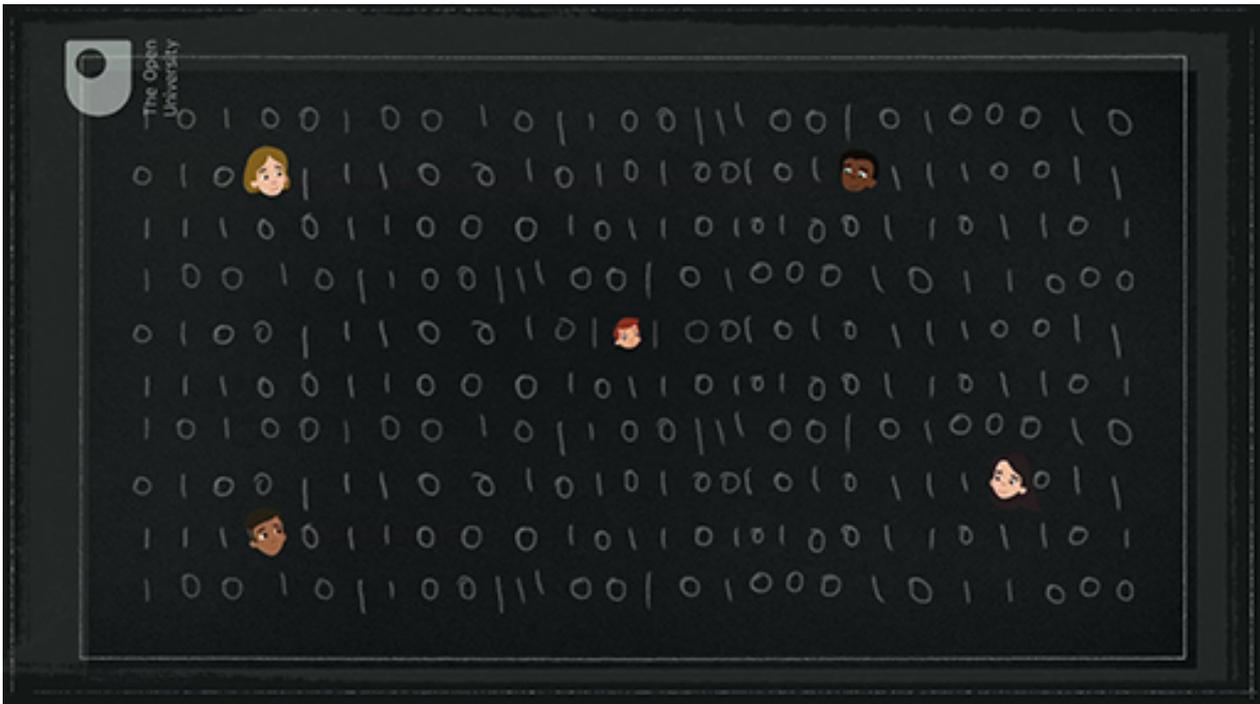
# Week 1: How different is a digital childhood?

## Week 1 Introduction

Childhood is a time of rapid change. Some of these changes are obvious, such as height gain, language ability and physical dexterity. Others are less obvious, such as how children make sense of the information in their environment. Social scientists try to understand every aspect of children's development, including how children learn, think and interact with those around them, and how their personalities and temperaments emerge.

Video content is not available in this format.

[Introduction Video](#)



In the video you heard from Dr Nathalia Gjersoe, one of the authors of this course. She is a developmental psychologist in the Faculty of Education and Language Studies at The Open University, with a research interest in children's cognitive development (as well as a mum herself).

The other author is Dr Natalia Kucirkova, who is a researcher in early literacy, with a specific focus on the role of new technologies, shared book reading and personalisation.

To understand the rapid changes of childhood, children's abilities are often judged against developmental milestones, such as acquiring language (babbling, talking), cognition (thinking, reasoning, problem solving), motor coordination (crawling, walking) and social skills (identity, friendships, attachments).

The main question here is how digital technology influences the acquisition of these important skills. Does technology hinder children's physical, social and cognitive development, or does it provide exciting opportunities for learning new abilities?

### Activity 1.1

What do you think? Does technology hinder children's physical, social and cognitive development, or does it provide exciting opportunities for learning new abilities?

Make a note of your thoughts at the start of this course. Use a notebook or Word document that you can refer back to at a later date.

The Open University would love to know what you think of the course and how you plan to use it. We're really interested in hearing from you whether you plan to study every week, take part actively in discussions or prefer to sit back and watch how they unfold. Your feedback is anonymous but will have massive value to us in improving what we deliver. Take our [start-of-course survey](#).

## 1.1 A family discussion

You may have grown up in a world which was very different to today's. Perhaps there were only a few television channels, or perhaps you remember the days of black and white broadcasting, when the term 'digital device' was not in the vocabulary. But how different was your experience of childhood from that of today's children? Do you think it was different in fundamental or just in superficial ways?

You'll start your online journey with a scenario that might sound familiar, a typical family discussion involving adults and their children on holiday together. Imagine the scene after a full day of physical activities some of the children start asking where their games console is and whether the campsite has a wireless password. The oldest child is eager to get online and post an update on Facebook. This provokes much discussion between the parents and children, with the main thrust being 'why is technology so appealing' and 'how have technologies sharpened problems with children that parents have always faced?'



**Figure 1** Is family time spent away from technology increasingly precious?

Some of the parents want clarity over terms, and this indeed is the point of the story, as we need to agree on definitions to use in this course too.

What counts as ‘childhood’? Among many parents, and indeed experts, agreement on this is tricky; but here we consider the 3–14 age range as our main focus.

Similarly, what is ‘technology’? And what do we mean by ‘digital worlds’? One parent has a very clear definition. She says technology is best thought about in terms of hardware devices and outputs. Namely ‘computer, tablet devices and mobile phones, and the outputs – such as DVDs, websites, games, and interactive stories – that are viewed, read, played or created on these devices’.

Throughout the course you should also adopt this definition but also add some ideas from an Australian researcher, Sue Bennett, which will help you to focus more on how children use this technology. Bennett (2012) suggests that technology refers not just to the physical hardware but also incorporates different functionalities such as communicating (texting, instant messaging), sharing (blogs), searching (Google), reporting (camera use) and socialising (social networking sites).

This campsite scenario has helped us define exactly what we are investigating. The questions now are what makes digital technology so compelling and motivating? And are we raising a new generation of children for whom technology is as natural as breathing?

### 1.1.1 From zero to eight



**Figure 2** How young is too young to be a digital child?

It's difficult to ignore the rapid rate at which young children's access to technology is growing, especially with the introduction of tablets, touchscreen devices and the internet. The sudden increase in the adoption of technology applies to younger and older children alike.

Both Ofcom (2014) and the NSPCC (Jütte et al., 2014) found that one in three children owned their own tablet. Figures published by the NSPCC also show smartphone ownership increasing with age (20 per cent of 8–11-year-olds and 65 per cent of 12–15-year-olds) (Jütte et al., 2014). These profound changes are reshaping children's digital environment.

The recent EU Kids Online Network project, called Zero to Eight, illustrates just how pervasive technology is becoming for younger children. The project report identified a significant increase over the previous five years of children under nine years old using the internet (Holloway et al., 2013). In particular it noted a growing trend for very young children (pre-schoolers) to use tablets and smartphones to access the internet:

There is an emerging trend for very young children (toddlers and pre-schoolers) to use internet connected devices, especially touchscreen tablets and smartphones. This is likely to result in an increasing number of very young children having access to the internet, along with a probable increase in exposure to risks associated with such internet use.

(Holloway et al., 2013, p. 4)

There is a note of caution here. Professor Sonia Livingstone, the lead author of the EU Kids Online project, has previously shown that children are now going online at a younger age, and warned that often their 'lack of technical, critical and social skills may pose [a greater] risk' (Livingstone et al., 2011, p. 3). The challenge for parents is how best to manage the risks alongside the benefits; this is an issue you will think about later.

You may like to read an [extract from Holloway et al., 2013](#) on this subject.

### 1.1.2 A moral panic?

The following audio recording explores some of the implications of pervasive digital technology. Mariella Frostrup is joined by a panel of experts and commentators including Professor Tanya Byron, Professor Lydia Plowman, Julie Johnson and Helen King, to discuss raising 'digital kids'. They ask several important questions, such as:

- Should children under the age of two avoid any contact with technology?
- Should pre-school-age children engage with age-appropriate social networking sites as a form of 'training'?
- Are there any benefits associated with young children's early exposure to technology?



**Figure 3**

Audio content is not available in this format.  
[Bringing up Britain](#)

#### Activity 1.2

You will notice that in this clip Tanya Byron refers to 'moral panic'. This was a term suggested by the sociologist Stanley Cohen in 1972, suggesting that panics occur

when a particular issue is seen as a threat to conventional social norms. The most common moral panic is that technology is promoting 'social isolation, lack of social skills and obesity' (Palmer, 2007).

Do you agree or disagree with this suggestion?

Write a paragraph to explain your views.

*Provide your answer...*

### 1.1.3 Why is technology so appealing?



**Figure 4** Why do children find digital technology so absorbing?

As Lydia Plowman suggests in the previous section, children are often very engaged by digital technology. But why is it so compelling for young children to spend so much time interacting with their digital world?

First, technology is fun. Child-centred technology in particular is especially designed to be as entertaining and captivating as possible. Similarly, a big attraction of technology for children is that they see their parents and peers using it, and a major part of childhood is 'modelling' the behaviour of those around them, particularly parents that is, children learn from observing and imitating others around them.

Richard Ryan and Edward Deci's (2000) self-determination theory (SDT) for what motivates people seems particularly relevant to untangling the reasons behind young children's fascination with the digital world. According to SDT, there are two overarching types of motivation, 'intrinsic motivation' and 'extrinsic motivation'. The former refers to

doing an activity for its own sake because it is enjoyable (Ryan and Deci, 2000), and this is thought to lead to persistence, good performance and overall satisfaction in carrying out activities.

Ryan and Deci outline three basic psychological needs associated with intrinsic motivation that can be applied to children's use of technology:

- **competence** children succeeding in what they do and feeling that they can master a challenge effectively
- **relatedness** children connecting with others and feeling close to other people using online networking
- **autonomy** children being in control of their lives and making rational choices about how they use technology and for what purpose.

Although each of these three basic psychological needs may not be met for every child, the self-determination theory offers a good psychological basis for understanding children's intrinsic motivation in using technology.

## 1.2 Are children and adults today really so different?

Follow the link to watch '[Digital devices and children](#)' before returning to continue.

This video begins to untangle the generational gap between children and adults and explores – indirectly – some of the reasons why such differences emerge. It suggests that children are modelling their parents' behaviour and are being introduced to digital technology at a much earlier age than children previously. It shows parents voicing unease with this, and Jim Steyer, co-founder of the US non-profit organisation Next Generation, introduces some of the issues around modern technology and children's social behaviour.

Most children in the UK are currently spending more time with technology than they do in school or with their families (Lauricella, Wartella and Rideout, 2015). Similarly, children as young as 2, 3 and 4 are playing with their parents' phones or tablet devices; and some psychologists argue that this has an enormous impact on their brain development, as well as on their social, emotional and cognitive skills.

This raises an important question in this 24/7 digital universe, should parents be setting new rules for their children's engagement with technology? Is it perhaps time to promote new parenting classes for the modern age?

## 1.2.1 Introducing 'digital natives'



**Figure 5** Digital natives and digital immigrants.

The idea of a generational divide between children and adults has been a popular topic among psychologists and sociologists. This has resulted in the use of labels such as the 'digital native', the 'net generation', the 'Google generation' or the 'millennials', each of which highlights the importance of new technologies in defining the lives of young people. The most contentious term is the 'digital native' (Palfrey and Gasser, 2013). The term first appeared in an article by educational writer Marc Prensky (2001) to describe those children who spend much of their lives 'online', constantly 'switched on'. It represents 'native speakers' who are 'fluent in the digital language of computers, video games and the Internet' (Prensky, 2005, p. 8).

There is a distinction between 'digital natives', who are those generally born after the 1980s and are technologically adept and comfortable in a world of technology, and 'digital immigrants', who are generally born before the 1980s and are fearful or less confident in using technology.

To justify his claims Prensky draws on the widely held theory of neuroplasticity. This means that our brains are highly flexible and subject to change throughout life. The different neural connections in the brain change and evolve throughout childhood in response to the environment. It is claimed that young children's brains now are developing differently to the way adults' brains have developed, as children are growing up surrounded by new technologies. This topic of neuroplasticity is something that you will revisit in Week 3 of the course when we look at cognitive and biological changes during childhood.



interpretation of the digital divide. Helsper and Eynon in their 2010 review article quite rightly ask the question 'Digital natives: where is the evidence?'

Many have argued that Marc Prensky's provocative article of 2001 represents mere opinion and speculation and lacks any clear scientific evidence to justify his claims. Sue Bennett (2008) argues that the actual situation is far from clear, being neither empirically nor theoretically informed. She even goes as far as to say that the debate itself has been described as an academic form of 'moral panic'.

A question frequently discussed is if children now do learn in different ways to children in the past, what are the implications for education? Are children now finding traditional schooling increasingly difficult to engage with? So far there is little evidence of serious dissatisfaction or disengagement in young children's education, and making any change to our current educational system on the basis of speculation would have drastic consequences for children's learning.

Despite this, Prensky's original claim of a divide between the old and the young continues to be perpetuated even in 2015. Simply enter the term 'digital native' into an internet search engine and see how many hits you find!

Next you will begin to explore how the hopes and dreams often associated with new technologies can be balanced against the perceived risks and vulnerabilities.

You might like to read an [extract from S. Bennett et al., 2008](#) which looks further at this subject.

#### Activity 1.4 Is there really a generational divide?

Thinking about what you have covered in the last few steps, try to answer the following questions.

- Are some specific kinds of technology more readily adopted by children than others?
- How is children's use of technology different from their non-online activities?
- Do you think there is a distinction between 'digital natives' and 'digital immigrants'?

Make notes about your answers to each question.

## 1.3 Digital pessimists



**Figure 7** Do screen-based games lead to problems in children's mental and physical development?

Many parents, educators and psychologists have legitimate reasons to worry about children's engagement with the digital world. We live in a risk-averse society and this is certainly true with regard to children. We know that children are likely to run risks if they access the internet unsupervised, or stay online for long periods of unbroken time. Adults' fears for children and their worry about their own lack of control over their children are the single biggest obstacles to accepting digital technology.

Debates often express moral or social anxieties such as claims that children's cognitive, emotional and social development is under threat. Such anxieties are often perpetuated through the social media and reinforced by books.

For example, Sue Palmer, in her thought-provoking and provocative text *Toxic Childhood How the Modern World is Damaging our Children and What We Can Do About It* (2007), discusses many of the issues around digital technology and claims that 'every year children become more distractible, impulsive and self-obsessed – less able to learn, to enjoy life, to thrive socially'. Very often pessimism is directed towards screen-based media (such as television, games consoles and computers), with the assumption that they lead to a number of ills, including social isolation, lack of social skills and obesity.

Examples of the apparent risks appear in the work of Howard-Jones (2011), who analysed current research in neuroscience and psychology. He states that the developing brain can be susceptible to environmental influence, and digital technology opens it to risks including:

- aggressive responses in children caused by playing violent and often aggressive video games
- interference with psycho-social wellbeing and children's attention
- the potential for disrupted sleep and damage to children's health.

With some online searching you might also find current research into so-called internet addiction, aggressive game-playing and bullying, which have also been linked to children's exposure to the digital world.

### 1.3.1 Poll: Are you a digital optimist or pessimist?

It's hard not to fear for our children when we see the popular headlines about potential hazards. And as Sue Palmer openly argues, digital technology can have a tremendous, damaging effect on children's lives as they become distractible, impulsive and more self-obsessed.

However, other commentators see technology as a positive vehicle for enhancing children's learning and development by harnessing the enjoyment and feeling of being in control that it gives children.

To view this content please access the complete course on [OpenLearn](#)

### 1.3.2 Back to the experts

Whether you are a digital optimist or pessimist, it's obvious that while technology brings about opportunities, it also has associated risks. This has led to some paediatricians, psychiatrists and psychologists arguing that parents should limit young children's use of, and exposure to, new digital technologies. But is this really the answer? Is simply restricting children's access actually the best way to ensure their safety?

Sonia Livingstone is a professor in social psychology and a leading researcher in children's media. In the following video, she tackles some of these important questions and considers whether prevention really is the best cure. She considers how restricting access to technology may also restrict opportunities for children to develop resilience against future harm.

Video content is not available in this format.

[Sonia](#)



What do you think about her advice on minimising online risks and on how parents can best support children's engagement with technology?

### 1.3.3 Digital parenting



Figure 8 How can parents help their children to make the most of digital technology while

### also protecting them from the dangers?

While the internet and technology represent both opportunities and risks for children, simply restricting access or removing technology from children's lives seems inappropriate. Perhaps we need to review parenting methods so we ensure sufficient levels of support for children growing up in this highly digital modern world.

Jim Steyer, who you met in the video in *Are children and adults today really so different?*, said 'As a parent in this 24/7 digital universe, there're some new rules that we need to learn for ourselves, and then that we need to teach to our own children.'

What are these rules and how can parents actively support their own child's safety online?

If we reflect back to self-determination theory, the idea of giving children autonomy and choice to make appropriate decisions about their own digital world could be the answer here. According to some social scientists, we need to trust in the maturity and judgement of children. We have to be able to trust their social skills in successfully negotiating these new ways of behaving and successfully managing or avoiding risks (Banyard and Underwood, 2012).

It is important to recognise that children's perceptions of problematic online situations may differ greatly from those of adults. Because of the different perceptions of adults and youngsters, and the lack of a neat distinction between positive and negative experiences online, many psychologists opt to avoid the term 'risk', and prefer to talk about 'problematic situations'.

A recent EU Kids Online project (Vandoninck et al., 2014), based within the UK, tackles the idea of giving children autonomy to make their own choices. Awareness of online risks motivates children to concentrate on how to avoid problematic situations online, or prevent them from (re)occurring. This brings us to the concept of preventive measures – what children actually do or consider doing in order to avoid unpleasant or problematic situations online.

Sofie Vandonick and colleagues (2014) identified five main categories of measures discussed in the literature:

- **Problem-solving strategies.** Teach children the appropriate actions and strategies to allow them to tackle the possible risks.
- **Planning, reflecting.** Encourage children to reflect on how they would prevent hypothetical ('what if?') problems, deciding on how and why these risks occur and how they would determine whether a hypothetical situation is problematic or not.
- **Information seeking.** Increase children's knowledge and understanding about the kinds of online security and risks.
- **Support seeking.** Encourage children to approach others (parents, teachers) to obtain advice should problematic situations occur. This should help prevent further incidents or problematic situations from happening.
- **Fatalistic approach.** Accept the situation that risks are out there, without trivialising or generalising the situation.

Perhaps a key focus should be on helping children to acquire the knowledge and skills to moderate their own online behaviours; to develop resilience to risks and to become responsible digital citizens of the twenty-first century (Banyard and Underwood, 2012).

If you are interested, read

[Preventative measures – how youngsters avoid online risks, by Sofie Vandonnick et al. \(2014\).](#)

### 1.3.4 Creating responsible digital kids



**Figure 9** What does a digital world hold in store for the next generation?

Young children are immersed in a digitally rich environment, from tablets to desktops and texting to social networks. Digital technologies have potential benefits in the areas of cognitive, social and physical development. They have huge appeal for children, and this can be harnessed to help children socialise, develop and learn.

At the same time, parents and social scientists also fear that children's over-use of digital technology might result in physical problems such as obesity, social problems such as isolation, or psychological problems such as high levels of aggression. There are also, of course, notable risks associated with online activities and fears from parents and educators about children's online safety. The suggestion of a digital divide means that children may be using technology in ways unfamiliar to adults, making it increasingly difficult to protect them.

However, simply restricting children's access or adding security controls won't offer all the protection they need. Threat is out there, but it is less than face-to-face threat and children are commonly able to find ways of dealing with it. It can be argued that we need to equip children with the skills and knowledge to avoid these risks and become responsible digital children.

Next week you will begin to explore the exciting opportunities that technology can offer for children's social development, and think about how social media and online interactions are changing as a result of children's engagement with new forms of online communication.

## Week 2: Social identities in cyberspace

### Week 2 Introduction

In this second week of the course you will focus specifically on children's social development, investigating the themes of communication, friendship, play spaces and identity, and comparing face-to-face experiences with those in the virtual world. The following video introduces some intriguing questions that are being asked about children's social identities in virtual environments.

Video content is not available in this format.

[Introduction](#)



Childhood, as we know, is a period of intense physical, social and mental development; it is a time when children experiment to make sense of the world. What role do digital technologies play in shaping early childhood experiences? Do they provide new opportunities for social awareness, such as establishing friendship groups and forming new identities, or do they, in fact, hinder children's social development?

### 2.1 'Homo interneticus'

The following video focuses on the changing nature of online relationships and introduces you to Dr Aleks Krotoski, who looks at how the internet is reshaping our lives and transforming how children think and relate to others. She talks to a range of individuals,

including Professor Susan Greenfield and eminent clinical psychologist Sherry Turkle, and asks their views on social networks and children's interactions.

Video content is not available in this format.

[World Wide Web](#)



The importance of the social and cultural environment to children's development is universally accepted. Children thrive on forming connections with other people in their immediate social environments, and psychological theories have consistently reinforced the importance of children's social and cultural environment in allowing them to communicate and interact successfully.

We know that social interactions and communication form an essential part of growing up. What do you think about the claims that experts are making about children's use of social networks and social media? What effect are digital social networks having on our children's relationships? Are social networking activities changing how children think, feel and communicate?

## 2.1.1 Social media: positive, negative or just different?



**Figure 1** Children's social lives have always taken shape through communication.

In the previous section you saw a range of views on the positive and negative aspects of social networks and social media.

### Activity 2.1

Read the blog post

[‘The effects of social media on children’, by Angela Barnes and Christine Laird \(2012\)](#), which is connected with a communication studies course at Eastern Washington University.

Use it to reflect on children's contemporary experiences of communication and what impact these might have. Think about:

- What would optimists and pessimists say about children's engagement with social media?
- Is technology really the cause of the positive and negative effects mentioned?
- Alternatively, might different types of children be influenced in different ways by technology?

You might like to create a table to organise your thoughts. Think about the comments made and organise them into optimistic or pessimistic views of digital communication.

### Discussion

## Optimists (positive aspects)

Digital devices have indeed brought a new dimension to children's communication. Not only can we bridge distance via emails and forums and social networks, we can also communicate immediately through texts and tweets. We have access to a much wider social community, and this can have implications for children's social and emotional development.

Perhaps the immediacy and elimination of distance can in fact help children to maintain friendships and strengthen family ties. Parents can gain a deeper insight into their children's lives, especially as face-to-face communication difficulties increase as children get older. After all, the 'grumpy teenager' is not a new phenomenon.

What about shy children? By bridging distance, digital communication can enable them to engage in a wider social environment (Taylor, 2013) and more generally can help children find others with similar hobbies and interests. Digital technology can, it is argued, promote inventiveness and creativity.

Some psychologists even suggest that digital communication might improve emotional connection, implying that children could become more empathetic online compared to in traditional face-to-face contact (Johnson, 2014).

## Pessimists (negative aspects)

In expanding their social community, children are exposed to a wider range of people, material and risks. The EU Kids Online survey found that many children had experienced cyberbullying, trolling and sexting, with 12 per cent of 9–16-year-olds encountering upsetting and inappropriate images (Livingstone et al., 2014, p. 6). Critics of the use of digital technology by children warn that children may be too naive and not yet emotionally and socially developed enough to be able to deal effectively with such risk.

As children's level of maturity and judgement is still developing, they are more susceptible to marketing, inappropriate social interaction, so-called addiction to online activity (games, texting, messaging) and identity theft through revealing too much information online.

Some research has shown that playing violent video games can lead to more aggressive behaviour. However, a lot of the research is unclear about the 'direction of causality'. Might it be that children who are naturally more aggressive are attracted to more violent video games and will be more strongly affected by them?

Research also suggests that children who engage in more digital social networking are more narcissistic. But similarly, perhaps children who are naturally more narcissistic are attracted to social networking and more sensitive to the experience?

Think too about the time frame of this sort of research. Are the effects of technology causing long-term changes? Researchers tend to test children immediately after they have engaged with the technology. Might effects be strongest then, but fade over time?

If you are interested, you could read [Taylor, 2013 in full](#).



**Figure 2** Are children's online social connections always a good thing?

## 2.1.2 Friendship made easy?



**Figure 3** Online friendships are with anyone, anywhere.

Establishing connections with peers and friends is one of the most fundamental aspects of childhood and social networks are a great resource for expanding children's friendships (Subrahmanyam and Greenfield, 2008).

As you saw earlier, social networks allow children not only to connect to people within their own circle of face-to-face friends, but also to form connections with a much wider group of individuals all over the world. Digital optimists argue that it is now easier for children to join online communities with shared interests, and that barriers such as shyness, disability and distance are more easily overcome.

But this raises an intriguing question: are children forming a wider range of friendship types online compared to their traditional face-to-face interactions? And are these networks really influencing the nature and quality of their friendships?

While we as authors were discussing this, one of us summarised their view succinctly:

Friendships made through coincidence and proximity may offer a different experience to online friendships. Virtual friendships cut across boundaries and can be more immediate so being online is creating a different type of friendship requiring a new skill set.

## 2.1.3 What is a friend?

In 1992 Robin Dunbar, an anthropologist, suggested that the optimum number of friendships one person can maintain is 148 (Dunbar, 2012). This theory has become

known as 'Dunbar's number'. Over the last two decades Dunbar has continued to review his theory. While he still maintains that 148 is the optimal friendship network, he talks about the existence of smaller networks within this, each differing in intimacy.

The French philosopher André Comte-Sponville has argued against Dunbar's basic premise. He believes friendship numbers are much smaller, with true friendship requiring more time, sincerity and intimacy than it's possible to devote to as many as 148 individuals (Joignot, 2014).

Digital social networks remove many of the physical and time barriers to staying connected with friends face-to-face. So do we need to revise Dunbar's number in this new digital world of friendships?

Clearly, what you believe depends on how you define 'friend'. Social networks allow children to connect to hundreds of 'friends', but are these friendships the same as face-to-face friendships?

Video content is not available in this format.

[Social Networks](#)



What does having access to an almost limitless number of digital 'friends' mean for children's social networks and their definition of a friend? Think about what friendship means to you.

You'll move now beyond social networks to consider how children engage in virtual environments.

## 2.2 Play in an online world

Playing online appears to have many positive strengths, from learning new social skills to educational benefits. Professor Lydia Plowman has researched the way children learn

through apps and games. In this [BBC iWonder video](#) she explains what parents can do to unlock the learning benefits of technology for young children.

A key focus, Lydia Plowman suggests, is allowing children to explore through parental guidance. Part of this process is children 'learning how to learn' by making their own choices and decisions.

However, playing online not only provides creative opportunities or educational benefits for children, it also provides enormous possibilities for imaginative fun in virtual worlds, as the next step discusses.

What do you consider are the advantages of online play for young children? Should parents allow young children to play independently online?

## 2.2.1 What is a virtual world?

It is important to agree on what is meant by a 'virtual world'. Would you agree that it would include the following elements?

- often an online computer-mediated 3D or 2D environment
- a shared and persistent experience
- interactions occurring in real time
- 'rules' determining how individuals effect changes
- individuals using an 'avatar': an icon or figure that represents that individual within the virtual world.

In that case, virtual worlds are platforms that might involve the user solving problems, exploring, role-playing or similar.

It's likely that if you live in the UK you will have heard of the popular CBeebies site produced by the BBC for pre-schoolers, children under the age of six. Music World is another example – a music platform used in primary schools for seven to 12-year-olds where children can create their own avatar to explore music and virtual musical instruments.



**Figure 4** Characters from the video game Moshi Monsters

Critics of virtual play put forward similar arguments to those used against digital communication more generally. They are concerned about the risks of exposure to a wider community and worried that children have less time to spend on real-world play and more ‘meaningful’, face-to-face relationships.

However, by 2014 there were over 158 virtual worlds designed for children, with the top three for primary-age children being Club Penguin, Moshi Monsters and Habbo Hotel. In fact, an AVG Digital Diaries survey (2014) found that of the 6–9-year-olds surveyed, 46 per cent spent their online time playing in virtual worlds.

Many parents or teachers feel that allowing children access to social networking sites is dangerous and unsafe. But the creation of ‘safe, child-friendly’ social networking sites, like Moshi Monsters, is changing the way we see online play.

Moshi Monsters is a social networking site designed specifically for young children. It has gained enormous popularity, despite media concerns about security and safety. Children can choose from one of six virtual pet monsters (Diavlo, Luvli, Katsuma, Poppet, Zommer and Furi) that they can create and care for. Once their pet has been customised, players can navigate their way around their virtual world and complete ‘Super Moshi’ missions. They can also personalise their own virtual room, play games and and communicate with other users in a safe environment.

There are many additional educational advantages of allowing children access to this online environment. By solving a wide range of fun, daily puzzles they gain new skills, including logic, spatial awareness, problem solving, numeracy and verbal communication. But how safe is the online world? Many parents feel comfortable with the relatively safe environment and the additional security features that the website offers, which has been the subject of newspaper articles.

A couple of quotes from parents:

With educational puzzles and a closely monitored forum for children worldwide to talk safely to each other, it's like a Facebook for kids and has the backing of many parents.

It's a very safe environment for the kids.

### Activity 2.2

Considering what you've read in this section, and your own experience of virtual worlds:

- Is there a difference between a child's and an adult's perceptions of using virtual worlds?
- To what extent can children's activity in a virtual world be described as play?

Write a paragraph explaining your views.

*Provide your answer...*

## 2.3 Forming an identity



**Figure 5** Who am I?

Play and social interaction are key ways in which children begin to develop their identity. Chana Etengoff, a professor at Columbia University, suggests that digital technology has resulted in new types of spaces for social interactions to take effect (Etengoff, 2011).

Children can immerse themselves in digital environments with some anonymity, in a way that they can't in real-world contexts. This can allow them to reinvent themselves and try out new identities that are different from how they are known in other spaces. Through virtual online play, children have access to a wider social community and can explore multiple aspects of themselves and experiment with social behaviours.

Children are very aware of what they want from digital worlds. For example, in 2008 the BBC created a virtual world, Adventure Rock, for children aged six to 12 and invited parents and children into the production process. Children identified freedom, self-expression, creativity and interaction as essential ingredients of a virtual world. They wanted an avatar which reflected their religion, culture and interests and they wanted a space away from adults where they could play with their identity through dressing up, could exchange views with others and could 'rehearse having responsibility for looking after things' (Jackson et al., 2008, p. 46).

If you are interested, you could read an [extract from Jackson et al., 2008](#).

### 2.3.1 Experimentation and the virtual self



**Figure 6** The avatar is a tool for experimentation.

Many developmental psychologists suggest identity experimentation is a key focus for early adolescence (Erikson, 1968; Valkenburg and Peter, 2008). The potential for experimentation with personal and social identity in virtual worlds is obvious and becoming increasingly popular in younger and older children alike.

The exploration of identity is nothing new; many children have experimented with self-expression through cultural tools such as fashion. The difference here is that children of all ages can construct multiple alternative identities by creating an avatar, their digital self, without impinging on their real-world life (Burke, 2013).

As Palfrey and Gasser (2008) clearly explain:

In virtual worlds, the key act of identity formation is the creation of an 'avatar' – a virtual representation of the computer user. In most instances, the avatar is a figure whose actions can be controlled by the user's computer mouse and keyboard. It is through this figure that the user interacts with the virtual world – both objects and other avatars (that is, other users). In many online games, the avatar is largely determined by the kind of role one chooses to play in the game's more or less predetermined storyline.

(p. 28)

In Teen Life, for example, older children can create and explore a wide range of social, cultural, political, educational and economic symbolic activities. These are seen as an extension to their everyday lives. The avatar body can be customised in a practically infinite number of ways ranging through height, weight, frame and figure, skin colour, eye colour, facial structure and gender, to fantasy animal avatars.

### Activity 2.3

Read the extract [Playing with Pixels: Youth, Identity, and Virtual Play Spaces](#) from Chana Etengoff.

Think through your response.

## 2.3.2 Identity and social behaviours



**Figure 7** Masked superheroes or villains?

Digital optimists believe that anonymity online can give children the freedom to explore and engage with different identities and behaviour patterns. Digital pessimists worry that this may allow them to falsify their age, fabricate events or misrepresent themselves, either innocently or deviously.

Little is really known about how online and offline identities fit together. Palfrey and Gasser (2008) suggest that children do not distinguish between their 'online' and 'offline' identities. Increasingly, the identity of just about anyone living in a digital era is a synthesis of real-space and online expressions of self.

There are also constraints built into many social networks (Willett, 2009; Cánovas, 2014). Children may want to reinvent themselves to show maturation, but be undermined by photographs or activity on their friends' online space.

What may be a greater concern is the amount of real information that children share online. Psychologists have developed what they call the 'disclosure decision model' to explain why older children often reveal so much information to others online. The underlying assumption is that people decide what personal information they will disclose, how they will disclose it and to whom they will disclose it, based on their evaluation of the possible rewards and risks. According to this model, the disclosure of personal information is intended to achieve certain benefits that might include social approval from others, intimacy or relief of distress.

You could read the an extract

[Born Digital: Understanding the first generation of digital natives from Palfrey and Gasser, 2008.](#)

### 2.3.3 Navigating the digital landscape



**Figure 8** Technology provides access to many social connections.

Digital technology and virtual environments are providing an exciting opportunity for children to explore their own identities and establish new connections with friends and peers. You have considered whether digital technology is providing new opportunities for children's social awareness, such as establishing friendship groups and forming new identities, or whether it is in fact hindering children's social development.

We know that digital technology and virtual worlds can potentially enrich children's social lives and social development in quite innovative ways, something that is clearly emphasised by Jim Taylor writing in the *Huffington Post*:

Every day in so many ways, this new technological landscape brings many wonderful benefits to our family's lives and relationships. At the same time, as with any new innovations, this impact has a dark side.

(Taylor, 2013, p. 1)

#### Activity 2.4

Has your thinking changed as a result of this week's study? Review your thinking – what were your views about children's social development in a digital landscape before this week? If any of them have changed, why is this?

In the next week you will continue to explore the exciting benefits of digital technology, with a focus on children's cognitive development and how they acquire the skills to learn about the world around them.

## Week 3: Learning to think in a digital age

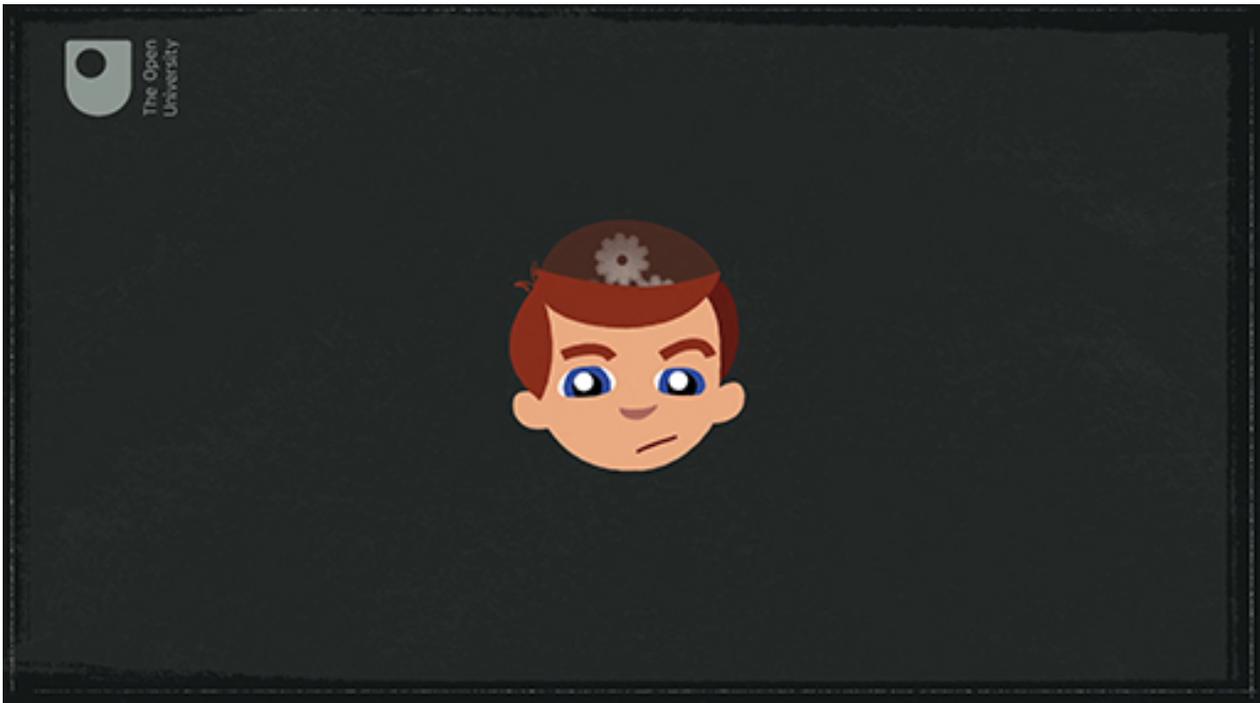
### Week 3 Introduction

You will now move on from the social world of children to the potential influence of digital technology on children's learning.

This short video introduces you to some of the key ideas about how we learn. It is not a simple case of inputting knowledge and experiences into the brain; getting to grips with the different ways in which we learn is the starting point for understanding development.

Video content is not available in this format.

[How we learn](#)



This week you'll consider in particular how children might be processing new information differently now how does digital technology help to mould the learning mind? How do the social and other experiences it offers influence our ability to learn or to retain new information, and do these experiences actually affect how we think, feel and develop?

## 3.1 A pyramid of digital engagement?

Young children learn about the world in a number of different ways. Sometimes they think through a problem and work it out, sometimes they try out different solutions until they find something that works and sometimes they learn best by watching and talking to the people around them.

One way of thinking about children's learning in the digital world is to consider their actual engagement with it. How is this different from traditional ways of learning information?

Wheeler's 'engagement pyramid' of digital learning (Wheeler, 2013) suggests that the majority of screen activities online involve a similar progression to those offline, from passive activities of watching, 'lurking' and reading to more active processes. We could argue that all learning follows a similar pattern, whether online or offline. Children start to learn initially by simply watching and listening to absorb what's going on, followed by internalisation of the process to the point where it can be used creatively. Language, maths, science, philosophy – they always need a passive phase followed eventually by creativity and finally by 'curating' the individual's own ideas.

**Figure 1** Wheeler's engagement pyramid of digital learning.

If you consider Wheeler's pyramid, this pattern becomes clear. The wide base of the engagement pyramid suggests that a great deal of children's digital engagement is fairly passive. For example, simply 'watching' or 'lurking' in the background. Children in this category only absorb content, like blogs, videos, podcasts or status updates, by observing others. They gather information in order to take decisions or to learn from others; or else they are looking solely for entertainment.

Now consider the upper layers of the engagement pyramid (commenting/discussing and creating/inventing). It is only here that children actively and meaningfully engage with their online environment in ways that can transform their thinking, through creating, editing and communicating ideas. Children who respond to others' content, for instance through comments on blogs, news stories, status updates or reviews, are actively participating by giving support or contributing ideas. They are also actively creating or inventing by writing and publishing their own content, for example on blogs or sharing sites such as YouTube or Tumblr.

### 3.1.1 Learning through communication



**Figure 2** Technology offers new opportunities for learning by communicating.

Children learn a huge amount from the people around them through interacting and exchanging ideas. Very often we learn new facts and information by talking, speaking and interacting socially, and this is most evident in text messages and smartphone applications such as social networking or instant messaging.

A new way of writing and speaking has evolved through digital communication technologies such as social networks and text messaging. In some ways children are learning by creating and inventing new modes of communication.

Children are basically learning a new kind of language that is still evolving, and converting spoken to written language in an interesting way. The use of text message abbreviations is often referred to as 'text speak' or 'textisms' (Underwood and Farrington-Flint, 2015). While some people consider text as a method of conveying derogatory messages (Kleinman, 2010), the advantages of text speak are its speed and immediacy, particularly in creating newer versions of our written English. Consider these examples, where children were asked to translate text abbreviations into standard written English:

4got 2 call k8 2nite bcs i woz studyin, i h8 xamz

LO! How R u? I havnt cn U 4 ages

hi m8 u k?-sry i 4gt 2 call u 1st nyt-y dnt we go c film 2moz. hav U dn yor h/w?

Im goin out w my bro & my best frNd tomorrow

Do U wnt 2 cum along?

(From Plester et al., 2008, and De Jonge and Kemp, 2012)

How easy was it to decipher the meaning of these text messages? For many children it's easy, although for others it can seem like a completely new language.

Optimists view text message abbreviations as playful, inventive and creative features, but pessimists feel that they threaten more traditional standards of written English, leading to a generation of 'linguistic ruin' (Cingel and Sundar, 2012). For the slightly older age groups there are similar arguments about the use of Twitter, suggesting that abbreviations found in tweets are often shorthand forms that reflect nothing more than examples of poor grammar (Grosbeck and Holotescu, 2008). However, the sheer popularity of texting among children prompts us to question whether these academic critics are in fact correct. And not all academics share the same opinion, as you'll see in the next section.

### 3.1.2 Texting is killing language

In this fascinating talk, John McWhorter, a linguist and political commentator, argues that texting is not such a negative phenomenon. He views it as 'miraculous' – not just energetic, but a highly creative activity. He suggests that there's much more to texting, linguistically and culturally, than there might seem. In relation to learning, the video demonstrates that children learn through 'creating' and 'inventing' new ways of communicating and exchanging ideas.

Video content is not available in this format.

[John McWhorter](#)



Do you think McWhorter feels that texting has a positive or negative influence on children's language? As he says, there are cognitive benefits; now we can write the way we talk, and texting should be seen more like 'casual speech' than actual writing.

A further worry from the pessimists is that text messaging and using different kinds of technology might not be helpful to children's learning but in fact act simply as a distraction; this is the issue discussed in the following sections.

### Activity 3.1

Having listened to the opinions of John McWhorter, consider how you feel that digital technology is shaping children's learning through communication. Think about the following questions.

- Are there any advantages for children learning to use text abbreviations as a way of communicating with friends? Are they really as 'miraculous' as John McWhorter suggests?
- Is there a risk that knowing and using text abbreviations may have a detrimental effect on children's traditional written language skills?

Make some notes about your views.

### 3.1.3 An epidemic of distracted youngsters?

Many 'digital natives' multitask with technology. They can be texting on their smartphone, sending an email, logged into Facebook and listening to music, all at the same time. A recent study by CourseSmart and Wakefield Research (Kessler, 2011) surveyed 500 college students and found that 73 per cent were not able to study without some form of technology, and 38 per cent reported that they were not able to go more than 10 minutes without checking their laptop, smartphone, tablet or e-reader.

For the new generation of children and teenagers, this multitasking behaviour is an expected part of their everyday life. Text messaging and social networking are clearly important to them and can be emotionally gratifying. But how do such technological distractions impact on their learning and attention? Research has increasingly examined issues of multitasking and distraction as children squeeze more and more activities into their days and evenings. Is technology merely a distraction from learning or is it in fact promoting a skill that is of genuine value?



**Figure 3** How many different kinds of almost simultaneous input can one brain cope with?

The problem with multitasking is the need to keep changing backwards and forwards from one activity to another, switching your thoughts between tasks repeatedly. Multitasking with a phone is so prevalent among those with access to these technologies that one study even called it the 'epidemic of distraction' (Valkenburg, 2011). The question whether heavy multitaskers disadvantage their future development is taken up by Lui and Wong (2012), who show negative consequences of multitasking. Children have been shown to perform poorly in certain cognitive tasks involving task switching, selective attention and working memory, possibly because they tend to pay superficial attention to lots of information all at the same time without focusing sufficiently on the information that is most relevant to the task (Lui and Wong, 2012). You can imagine the media headline related to this 'Modern Kids Unable To Focus Due To Distractions', or similar.

Again, however, not all experts agree that multitasking is bad for children.

### 3.1.4 Multitasking as a new way of learning



**Figure 4** Perhaps video games can make us more alert and improve learning.

Multitasking may not always be detrimental to learning. Some scientific studies (Cardoso-Leite and Bavelier, 2014; Granic, Lobel and Engels, 2014) have also shown positive effects of multitasking.

In video games, for example, children need to focus on several things at any one time and learn simply by trying things out and seeing what works and what doesn't. Many video games rely on this type of trial-and-error learning, which offers regular rewards and reinforcements that improve learning. Researchers have found that playing video games can be beneficial as they can promote divided attention skills, a sound foundation for multitasking. Playing games can even help promote alertness, quick reactions and brain development.

## 3.2 Brain development in a hyper-tech world



**Figure 5** Different parts of the brain are responsible for how children develop different cognitive skills.

In the face of the barrage of technology-induced stimulation, and new ways of learning and communicating, a common question from parents, educators and scientists is how is this affecting young brains?

In Week 1, you were introduced to the idea of a [‘digital native’](#) and linked it to the view of today’s neurobiologists and social psychologists that brains can, and do, change constantly with new input throughout our lives due to ‘neuroplasticity’ (Prensky, 2001).

A central discovery of neuroscience is that the brain continues to develop its ‘wiring diagram’ well into a person’s twenties at least. The frontal lobes, regions critical to high-level cognitive skills such as judgement, multitasking, executive control and emotional regulation, are the last to develop fully.

It might be useful to revisit those suggestions again and consider whether children’s brains are changing as a result of their engagement with technology, especially video games.

### 3.2.1 Your brain and video games

Brain scientist Daphne Bavelier wants to know how fast-paced video games affect the brain. She has some surprising news about how video games, even action-packed shooter games, influence our learning and focus.

As you watch the video, think about the key points that Bavelier raises with regard to the impact of video games on children’s development.

Video content is not available in this format.

[Bavelier](#)



The next section summarises other views on this topic.

### 3.2.2 The good, the bad and the ugly



**Figure 6** What is the balance of pros and cons for video games?

Although Daphne Bavelier suggests that video games can be extremely popular and supportive to children and their learning, not everyone takes this view. Since it is still early days in terms of the volume of research, there are as yet no definitive answers.

Consider some of the psychological evidence around the positive and negative aspects of gaming from an article focused on younger children (three to six years old), [The positive and negative effects of video games](#) from the Raise Smart Kid website.

Positive aspects may include:

- developing children's problem-solving and logical thinking
- improving hand–eye coordination, fine motor and spatial skills
- encouraging quick thinking and decision making
- improving memory and concentration and the ability to engage in multitasking.

Negative aspects may include:

- screen time binging is bad for the eyes
- violent video games are likely to increase aggressive thoughts, feelings and behaviours
- video games can lead to attention problems and greater distractibility
- they can lead to social isolation and less time spent in other activities
- they can encourage children to confuse reality with fantasy

- they can be detrimental to children's health, for instance in obesity or video-induced seizures.

### 3.2.3 Your view on video games

Next, you will think about your own views on video games.

#### Activity 3.2

Think about the following questions:

- In your experience is there a link between video game playing and negative behaviours, such as violence, aggression and social isolation?
- Being more of an optimist, what do you feel are the benefits of playing video games?

Make notes about your thoughts.

If you would like to explore more detailed accounts of the academic debate about such a 'rewiring the brain' topic, then we would recommend two names to use in online searches. Professor Susan Greenfield, a professor of psychology and pharmacology at Oxford University, is a pessimist while Neil Levy, Head of Neuroethics at The Florey Institute of Neuroscience and Mental Health, University of Melbourne, is more of an optimist.

## 3.3 The strengths of new technology

In the following audio, educational psychologist Paul Howard-Jones offers his views on the impact of gaming on children's development. He joins Daphne Bavelier in being more of an optimist. In particular, he focuses on how technology can help to shape the neural connections in the brain and strengthen the acquisition of new skills.



**Figure 7**

Audio content is not available in this format.  
[Computer games](#)

Do you agree with his views?

### 3.3.1 Prescribing video games for ADHD



**Figure 8** Can video games help children with attention problems to focus on a task?

Using games to change people's brains for health reasons is an ambitious and relatively new concept. Yet there is evidence that especially for children with additional needs, assistive digital technology has many potential benefits, in either remedying the disability or compensating for it (McKnight and Davies, 2013). Technology from low-tech toys to high-tech systems can provide support for cognitive processing or can enhance memory and recall.

In partnership with NASA, SmartBrain Technologies has created a number of interactive games, including a non-violent driving game that improves visual tracking skills, hand–eye coordination, planning, concentration, memory and patience. Orlandi and Greco (2004) tested the impact of playing this driving game on boys aged 9–11 years who had a primary diagnosis of attention deficit hyperactivity disorder (ADHD). The results showed that the non-game-playing group had a dropout rate from clinical support eight times greater than the experimental group who used the game. A factor of eight is huge; and the boys also showed a number of positive behaviour changes.

In another study Cardoso-Leite and Bavelier (2014) found that when children with ADHD played a video game that they enjoyed they exhibited similar positive behaviours, such as less impulsive responses and an increased ability to stay on task.

However, a word of caution despite their promises, not all games are created equal. A better understanding of the game-play elements that improve attention and learning, as well as of the strategies developed by the players, is needed.

### 3.3.2 Costs and benefits

This week you focused on how digital technology may be changing the way the digital child thinks and learns. You have looked briefly at some of the influences on that change, such as texting and the way that we engage with information and each other in an online environment.

You considered the impact of a digital culture on children's brain development and whether the benefits afforded by the digital world outweigh any costs. We hope the final part of the week has prompted you to consider innovative uses of technology to support children with developmental disorders and to explore how video games can actually help support and promote learning in interesting ways.

In the final week, you will look to the future for the digital child as a learner and what the learning environment might look like for them.

## Week 4: The future of childhood education

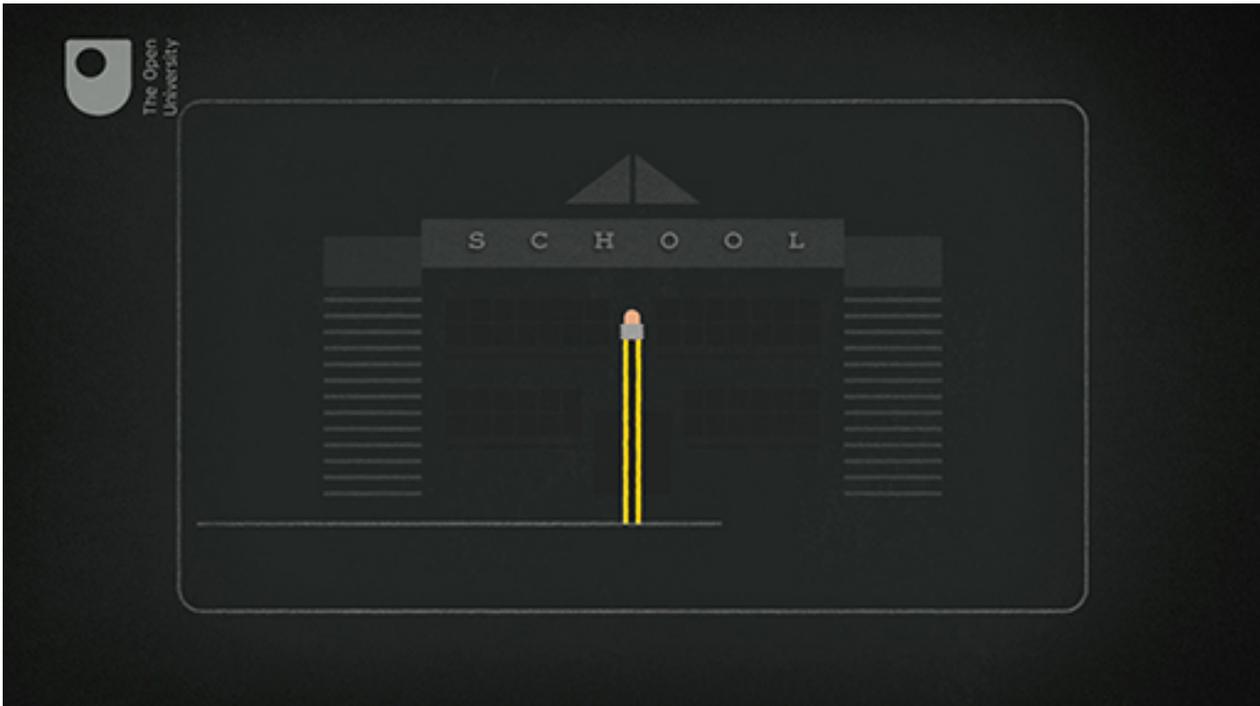
### Week 4 Introduction

You have seen in previous weeks that childhood is a time of rapid change, not just physically, but also socially and cognitively, as children learn new skills, adapt existing ones and become more equipped to deal with the world around them.

In this video and in the concluding part of this course you focus on the future, and especially on the impact of changes to formal schooling and education in the next decade and beyond.

Video content is not available in this format.

[Digital tools](#)



What can we learn from current ground-breaking examples to guide us when it comes to implementing technology in classrooms of the future? You will take a look at future possibilities in education which could have a huge impact, not only in the West but also in developing countries.

## 4.1 What could the future look like?

When you think about education, you probably think of a teacher standing at the front of a classroom imparting knowledge to pupils. However, there is a strong feeling among experts that technology is leading to change.

The following audio recording asks how well some of the more radical ideas about technology in the classroom are received, such as those practised at the Khan Academy. The [Khan Academy](#) is an online teaching service whose mission is to provide a free world-class education to anyone, anywhere. Ten million users every month log on to its online videos.

In the interview, Salman Khan, the Academy's founder, talks about the promise of these online resources. He suggests that the current model of education is outdated and that technology is now available to provide totally personalised learning.

**Figure 1**

Audio content is not available in this format.

[Khan Academy](#)

### Activity 4.1

Having listened to the audio, note your thoughts in response to the following questions:

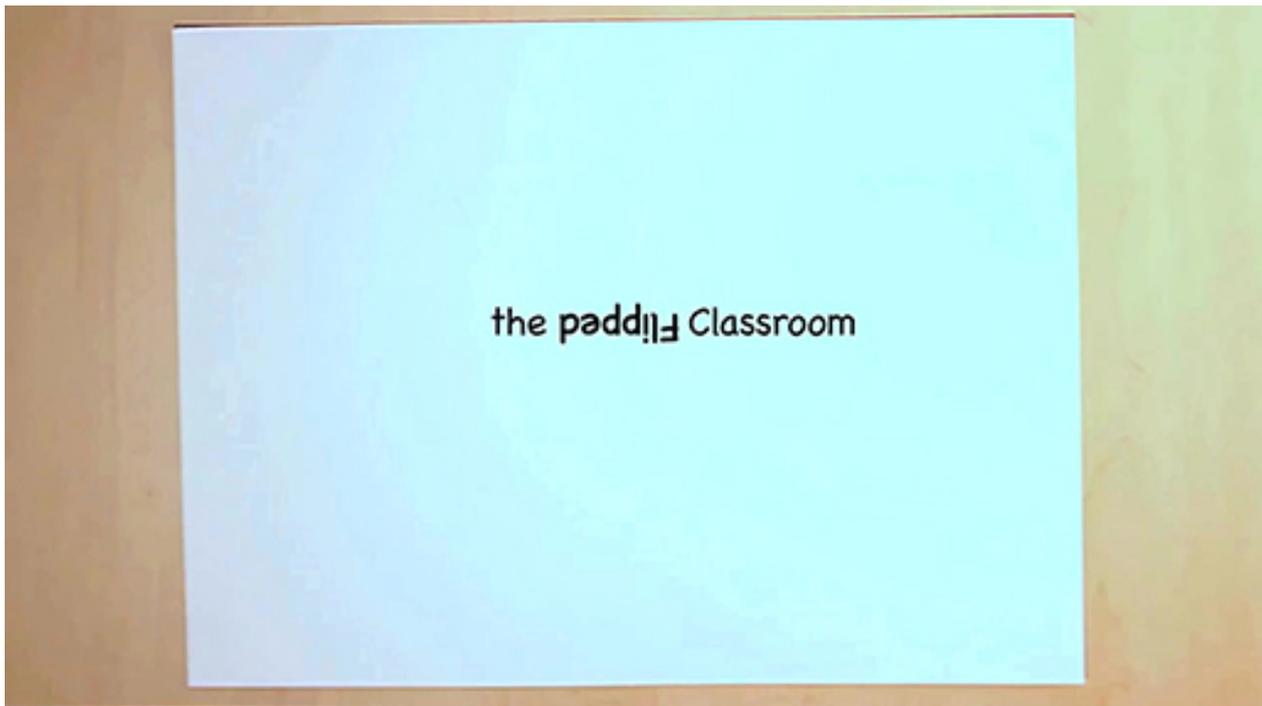
- What are your thoughts about the potential of the Khan Academy dashboard, and how this could change education in the future?
- What risks might be involved with adopting what might be considered a 'Big Brother' approach to monitoring the progress children make in their learning?

## 4.1.1 Flipped classrooms

The audio recording in the previous section referred to a 'flipped classroom', in which the teachers have changed roles to become classroom mentors. A flipped classroom sounds odd, doesn't it? But it's a popular teaching method in many US and increasingly UK classrooms.

Video content is not available in this format.

[Students](#)



There are various views of what flipped classroom and flipped learning mean for schools and teachers, but essentially they refer to turning the traditional classroom model on its head, as shown in the animation above. Do you feel the idea of a flipped classroom could become a reality in the 2020s?

A powerful concept is that teachers don't have to spend precious classroom time on explaining basic concepts; in a traditional class they can't focus on specific problems or address the needs of their individual students. The flipped classroom model clearly aims to maximise the time teachers have available for each student and often implies a turn towards technology-enabled teaching methods.

Central to this idea is the focus on giving children more autonomy in their learning and promoting 'personalised learning', in contrast to a more traditional 'one size fits all' approach. This personalised learning vision has resonance with what you learned in Week 1, especially around [self-determination theory](#). As you saw there, this theory supports the role of intrinsic motivation and emphasises the importance of giving children autonomy, sometimes within boundaries, to make choices in their own learning (Deci and Ryan, 2000).

## 4.1.2 Creating a new curriculum



**Figure 2** Children now are as familiar with computers in the classroom as with computers at home.

While some of the ideas of virtual or flipped classrooms might appear rather theoretical and take time to be accepted, there is already change afoot in the often dusty world of the educational curriculum. Now, with tablet computers and games far more widely accessible, educationalists leading the curriculum recognise that children need a new set of skills – indeed a whole new language – for this digital world.

With the launch of a new computing curriculum in England in 2014, coding has become an integral part of the national curriculum in schools. Pupils from as young as five years of age should in theory start to learn about creating and debugging simple programs of their own. Coding using algorithms and computational thinking will help children develop a language, together with systematic thinking and problem-solving (through simulation, trial-and-error) and storytelling skills that should prepare them for the future. It's a big shake-up for children and teachers alike.

As you might imagine, the changes have been widely praised within the technology industry. However, there are also critics questioning the value of teaching programming and coding skills to young children, or wondering whether enough teachers have the skills and support that they will need to teach coding effectively. This brings us, once again, to the digital divide (Prensky, 2001) from Week 1 – how might a distinction between digital 'natives' and 'immigrants' be affecting education and teaching?

## 4.2 Virtual schools?

In all this discussion of change there is even radical talk that technological advances might replace teachers altogether with virtual schools, particularly in developing countries. Viewed through a traditional educational lens this sounds absurd, but wait, don't leap to conclusions!

In developing countries there are projects that investigate the effects of teacherless environments. The rationale is that technology can provide a large-scale form of one-to-one teaching, and provide the necessary support in classrooms that often contain large numbers of children with only one teacher. In Malawi, for example, a classroom often has 90 children taught by only one teacher. So, can technology really transform the learning experiences of children in these developing countries?

Later this week you will see some encouraging evidence from a Malawi–Nottingham collaboration in which maths learning was demonstrably improved using digital devices. Here is a taster of one of the main findings:

What was so incredible was that in both countries (Malawi and the UK) we saw the same gain. One week of working on the iPads for 30 minutes a day [equalled] three months of formal education. ... We were amazed.

The children get immediate feedback on getting a question right. That's really rewarding. And if they don't get it right, they can't progress. They have to get 10 out of 10 to pass and move on to the next one.

(Kelly, 2014)

### 4.2.1 The School in the Cloud

In India Professor Sugata Mitra's work is another example of the belief that with a little support the technology can significantly improve student outcomes.

In the following audio recording Professor Mitra outlines his prize-winning School in the Cloud that works without teachers; it draws on a previous trial which he called his Hole in the Wall experiment. As you listen to Professor Mitra's interview, think about whether you are convinced by his suggestion that technology can teach children without teachers' involvement.



**Figure 3**

Audio content is not available in this format.

Computers

## 4.2.2 Your own views on education and technology

You will now think about your own views on this topic.



**Figure 4** Are teachers necessary to children's learning?

### Activity 4.2

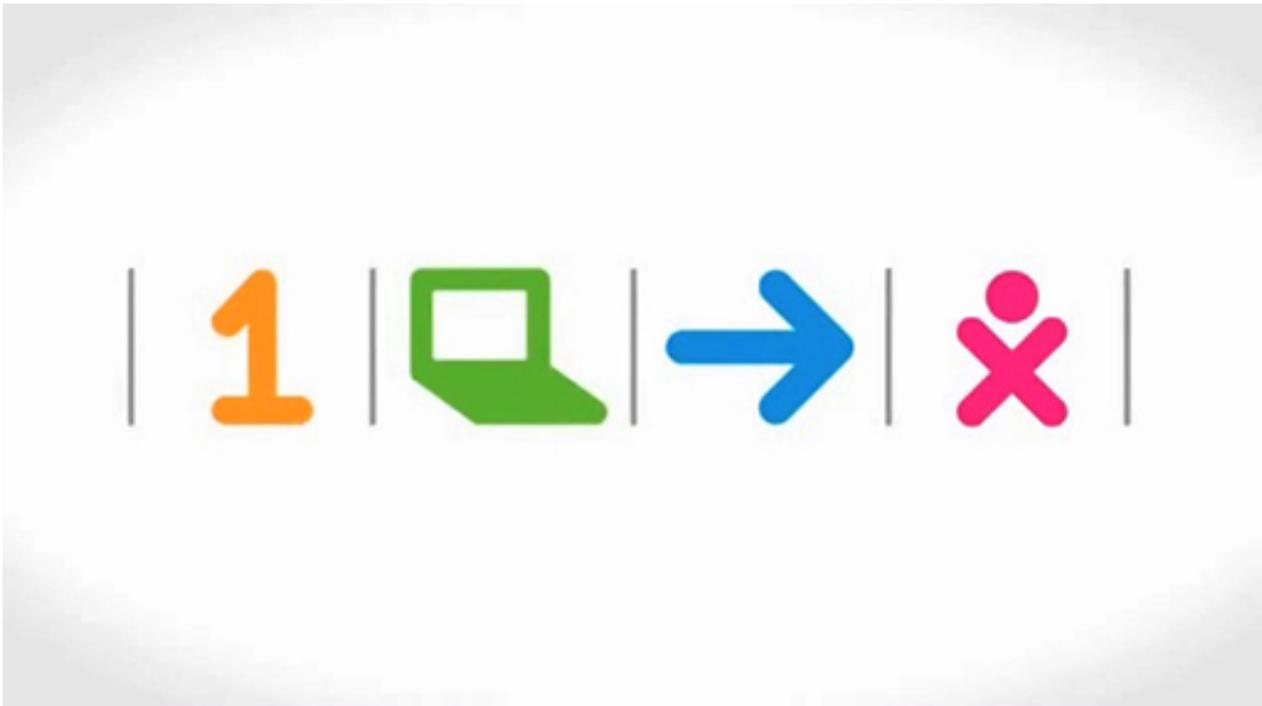
Following on from Professor Mitra's explanations, think about the following questions and make notes on your views.

- Do you think children can really speed up their own learning with the use of digital technology and limited teacher input?
- Could the same set of skills be achieved with a carefully designed piece of technology alone and no teacher input?
- What do you think teachers can bring to children's learning and development that computers and other technology cannot?

### 4.2.3 One Laptop per Child

Video content is not available in this format.

[Laptops](#)



We hope we have started to bust the myth that technology is only of value for children in industrialised, developed countries. If developing countries successfully blend access to high-quality teaching with access to technology, this may have global consequences.

Even in developing countries, there has been a focus on integrating technology into the educational lives of children. One Laptop per Child has become a benchmark project for the visionary use of technology in developing countries.

The mission was to create educational opportunities for the world's poorest children by providing each child with a rugged, low-cost, low-power, connected laptop with content and software designed for collaborative, joyful, self-empowered learning, as the video illustrates.

This project was first trialled in Cambodia, where the charity distributed \$100 laptops to every child. Given its relative success, the project has been rolled out further, and currently over 2 million children and teachers in 42 developing countries are learning with specially designed XO laptops.

However, the project hasn't been without difficulties and criticisms. Kenneth Kraemer and colleagues (2009) have questioned the sustainability of this project and looked at the 'vision' versus the 'reality'. Simply providing a new laptop to every child is only part of the complex puzzle.

Children need training in using the laptop and teachers also require considerable professional development to successfully embed such new devices in their classrooms. Technical support is often unavailable when things go wrong and schools lack the necessary resources or funding to make repairs. It may also be simplistic, if not naive, to assume that the same technology will work equally well in a different context or culture. However, there are signs of promise with other technologies too, particularly with tablet devices and digital apps, and these are what you will think about next.

## 4.3 Tablets and digital applications



**Figure 5** Tablet computers are particularly easy to use for all ages

Tablet computers might provide some of the devices that help a ‘flipped classroom’ operate effectively. Since their first appearance in 2010, tablet devices have been praised for their potential to enhance education, especially with young children. Yet there is still some ambivalence. While some educators enthusiastically embrace new media such as tablets for learning (e.g. Galloway, 2009), others argue that they have no place in young children’s lives (House, 2012).

In the UK, over 70 per cent of all primary and secondary schools now have tablet devices in their classrooms and 900,000 tablets are expected to be in schools by 2016. Young children in particular find them user-friendly research has found that their design presents very few technical challenges for young children, who quickly become enthusiastic and competent users (Lynch and Redpath, 2014).

The fusion of several technologies in tablet devices was seen by the researchers as creating a new ‘digital playground’ for children. Tablets have become increasingly portable, affordable and efficient, and they are specifically designed to accommodate a number of apps, many of which have a child-friendly, intuitive design for learning. For example, Neumann and Neumann (2013) describe tablets as tools for supporting reading and writing, with apps for alphabet matching, phonics games and stories.

In reality, the true potential of using tablets for educational learning remains largely untapped in many educational settings (Kucirkova, 2014). To explore their potential, we consider current findings on digital apps and e-books in the following section.

If you would like to, read the article

[Let's chalk up some rules before ipads enter every classroom, by Natalia Kucirkova, 2014.](#)

### 4.3.1 Can apps help children learn?



**Figure 6** An image from Our Story, developed by Open University researchers

The Open University has expertise in this field and is contributing to the knowledge base of how children's media, including tablet apps, can be evaluated to help parents make informed choices.

Natalia Kucirkova has summarised some key questions you can ask when deciding whether an app is or isn't appropriate for a child's educational purposes:

- What skills and experiences does the app facilitate? Open-ended apps are likely to offer creative opportunities, especially those which enable children to develop their skills incrementally through images, video, text and sounds.
- Does the app strike a judicious balance between entertainment and learning? The potential of apps is the greatest when flexibility and creativity are maximised for children, so they can, for instance, create their own personalised stories.
- Does the app help to build and sustain relationships and encourage children to engage with each other? For example, good story-making apps are those which engage the child in story sharing and learning about others through their discussions and interactions.

Our Story is an app designed by The Open University that allows you and your child to have fun and at the same time build up skills which will provide a foundation for starting to read.

The special feature of Our Story is that it is personalised, you can make your own stories and flash cards. These are a very important way to support children's reading development.

You can put your own pictures, drawings, noises, speech and text on flashcards and use these to play games that will help with learning new words, sounds and letters. You can also use these flashcards to build up a personal story which you can share together with your child.

The app has been designed to give you lots of different possibilities to suit you and your child – and we have several suggestions about ways to use the app which will support vocabulary and pre-reading skills.

### Activity 4.3

Read the article [Reading and child development: The Our Story app](#). How do you think it relates to Natalia Kucirkova's key questions?

- What skills and experiences does the app facilitate?
- Does the app strike a judicious balance between entertainment and learning?
- Does the app help to build and sustain relationships and encourage children to engage with each other?

Write a paragraph about your ideas.

*Provide your answer...*

### 4.3.2 What does the research evidence say?



**Figure 7** How successful are tablets in the classroom?

The evidence appears promising. Imagine the context in which young children can create their own digital stories using a combination of texts, images, videos and even sounds. The Open University research team has found strong indications that e-books and digital apps, such as Our Story, can lead to improvements in early literacy skills among both pre-school children (Kucirkova et al., 2013) and primary-age children (Flewitt et al., 2014). For example, one of the main conclusions was:

with just a little support from our team and a lot of teacher dedicated time – spurred on by the children’s enthusiasm – the practitioners discovered creative uses for the iPads in their classrooms, and recognised benefits for children’s self-esteem and enthusiastic engagement with a range of reading and writing activities.

(Flewitt et al., 2014, p. 16)

The point must be emphasised that it is not the technology alone that supports learning; careful planning and sensitive support by confident teachers is needed to ensure the technology meets its intended goals.

However, given this engagement on the part of teachers as much as of pupils, it does seem that digital applications on tablet devices can be successful in fostering literacy development. The question now is might these positive findings extend to other curriculum areas, such as maths? This is what we look at next.

If you would like to, read the article

[New directions for early literacy in a digital age: The iPad, by Rosie Flewitt et al.](#)

### 4.3.3 Accelerated maths learning in Malawi and the UK

The following video focuses on an initiative from the charity One Billion, which uses an app provided on tablet devices to support the poor maths abilities of primary school children in Malawi, where pupils' access to resources like teachers, computers or tablet devices is necessarily very limited.

Video content is not available in this format.

[Music technology](#)



The findings are quite remarkable, showing an accelerated improvement in maths performance despite the constraints. Dr Nikki Pitchford from the University of Nottingham has taken this initiative one step further, and provided the same app and access to a cohort of children in the UK.

As the video suggests, the use of apps can have a significant effect on children's learning, and this study is a clear example of how new digital devices and educational applications can help transform the lives of many children both in the UK and abroad by improving their educational experiences and success.

### 4.3.4 Poll: Have your views changed?

Now that you've completed the four-week course, you should have a more informed understanding of the impact of technology on children's lives.

How have your perceptions changed over the last four weeks? Why not complete the short poll below to see whether your views have changed and to what extent you are a digital optimist or pessimist now?

To view this content please access the complete course on [OpenLearn](#)

### 4.3.5 A new educational future



**Figure 8** Are schools in the cloud the future of education?

Technology is evolving at a rapid pace. How will this impact on children's education? Schools need to decide how far to go in adopting these new digital technologies, and how far they still need to focus on more traditional methods of learning and instruction.

The School in the Cloud and the flipped classroom are clear examples of how technology can and will transform the educational lives of many children, giving them more autonomy over their own learning.

In the current classroom context, you have seen how digital devices can be used to support the development of core skills like literacy and maths, and how digital apps can provide an engaging, stimulating and creative way of promoting children's learning.

In the future, basic programming will be on the syllabus for all primary-aged children in the UK. The more we can encourage children to create and actively contribute to the content delivered on the tablets and other technologies they use, the more it will be meaningful, motivational and personalised for them, and this may well be the start of creating a new educational future for all.

We would love to know what you thought of the course and what you plan to do next. Whether you studied each step or dipped in and out, please take our Open University

[end-of-course survey](#). Your feedback is anonymous but will have massive value to us in improving what we deliver.

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## Further reading

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### Week 1

[Toxic Childhood How The Modern World Is Damaging Our Children And What We Can Do About It](#)

[Preventative measures – how youngsters avoid online risks, by Sofie Vandonnick et al. \(2014\)](#)

### Week 2

[The limits of friendship, by Maria Konnikova \(2014\)](#)

[The Bad, the Ugly, and the Good of Children's Use of Social Media](#) by Jim Taylor (2013)

[Moshi Monsters](#)

[Club Penguin](#)

[Habbo Hotel](#)

### Week 4

[Seven kids coding projects that crowd funded their first steps](#)

[Let's chalk up some rules before iPads enter every classroom](#)

[Reading and child development The Our Story app Why can Our Story provide the first steps towards reading?\(Open University, 2011\)](#)

[Our Story \(app store\)](#)

[New directions for early literacy in a digital age the iPad](#) by Rosie Flewitt et al. (2014)

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1.2.3: Extract from: Bennett, S., Maton, K.A. and Kervin, L. (2008) 'The "digital natives" debate: a critical review of the evidence', *British Journal of Educational Technology*, vol. 39, no. 5, pp. 775–86.

### Audio visual

#### Audio

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2.3.2: Extract from: Palfrey, J. and Gasser, U. (2008) *Born Digital: Understanding the First Generation of Digital Natives*, New York, Basic Books, pp. 20–4.

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##### Video

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## Text

4.3.2 Flewitt, Rosie; Messer, David and Kucirkova, Natalia (2015) 'New directions for early literacy in a digital age: the iPad', *Journal of Early Childhood Literacy*, 15(3) pp. 289–310

## Audio and visual

### Audio

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