ICT – FOR & AGAINST

Toddlers, TV and touchscreens

Do ICT and multimedia in the early years have positive potential, or are they a danger to development? Here, two experts make their case

FOR

Touchscreens and TV are here to stay, so let's explore their positive features, says Professor Annette Karmiloff-Smith, Birkbeck Centre for Brain and Cognitive Development, University of London

Touchscreen use is growing at a phenomenal rate. A recent survey indicates that UK family ownership of touchscreens increased from 7 per cent in 2011 to a whopping 71 per cent in 2014 (Ofcom, 2014), with the likelihood of it soon reaching nearly 100 per cent. Instead of indulging in emotional reactions about the potential negative influence of touchscreens, let's explore their potential positive impact on child development.

What makes touchscreen devices different from other toys? Why are infants and toddlers (and older children) so fascinated by them? Why are children with ADHD quietly focused when using touchscreens (Stevens and Muslow, 2006)? Unlike passive TV watching, the child's active interaction with touchscreen devices generates dynamic, contingent, audiovisual sensory stimulation.

The variety, frequency and complexity of the contingent responses from touchscreen devices far exceeds anything that books or traditional toys provide. These are facts that cannot be ignored even if, as parents and teachers, we do not welcome the ways in which touchscreen devices are engulfing childhood activities. In fact, touchscreen devices may actually generate heightened levels of cognitive activity compared to books and other toys.

Moreover, the multi-touch interface allows an intuitive way of interacting with the device: witness how rapidly infants and toddlers learn to tap and flick a screen, well before they have fully developed their fine motor control (Cristia and Seidl, 2015). This combination of rewarding interaction, with varied sensory and cognitive stimulation, may have positive impacts on attention, memory, fine motor control and other cognitive abilities.

This is not a plea to replace books and toys with touchscreen devices. But it is a plea to recognise, alongside the importance of books and toys, some of the potentially positive socio-cognitive influences that touchscreen devices may yield.

EARLY DAYS

Recall that iPads were introduced merely five years ago – a recent contribution to young children's media environment. The enthusiasm with which children use these devices is evident, but hitherto developmental science has been slow to investigate in a detailed manner the relationship between tablet use and cognitive development.

In older children, scientists have already shown that actively playing video games yields enhanced visual processing as well as better attention and motor control (Foster and Watkins, 2010; Green and Bavelier, 2008), while passive TV viewing is associated with decreases in language ability (Allen and Schoffield, 2010). But what about younger children?

The use of touchscreens is growing fast, but research on their effects on

The majority of research on early media exposure is dedicated to TV and films (Christakis et al, 2004), with some findings indicating that, contrary to popular views, not all TV exposure is bad (Courage and Setliff, 2010). Exposure to educationally informed programming, co-viewed with a parent, has positive influences on executive function, receptive and expressive language, school readiness and numeracy (Linebarger and Walker, 2005; Linebarger, Barr, Lapierre and Piotrowski, 2014; Schmidt and Anderson, 2007).

How could such TV research findings be applied to infant and toddler use of touchscreens? Passive video viewing on tablets is likely to generate less cognitive stimulation than, say, an 'app' designed according to developmentally informed principles of learning (Hirsh-Pasek et al, 2015) or one that fosters collaborative sharing with a peer or parent.

This is because an adult co-viewer provides scaffolding (descriptions, labelling, pointing, questioning), making what is being viewed more salient to the child, and thereby increasing learning from screen exposure (Barr, Zack, Garcia and Muentener, 2008). However, with respect to touchscreen devices, empirical evidence of these relationships is currently lacking.

CONTENT AND INTERACTION

To understand the short- and long-term impacts of touchscreen use on socio-cognitive development, it is critical to distinguish between the actual content of 'apps' and children's modes of interaction with these devices. As found with childhood TV exposure (Linebarger et al, 2014), the developmental appropriateness of the content may maximise its positive impact on development.

It is not only crucial to examine the kinds of content that children choose on touchscreen devices, but also whether their use is mostly passive (for example, watching videos) or active (for example, playing games and using educational apps), and whether it is social (whether they play alone or share the experience with a peer or parent (Barr, Zack, Garcia and Muentener, 2008; Mendelsen et al, 2010).

This social mode of interaction may actually be facilitated by

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young children is in the early stages

touchscreen devices, due to their portability and facility for multiple children to simultaneously interact with them, compared to TV. So, an important question for future research will be how to foster the social use of touchscreen devices and how this relates to socio-cognitive development.

Given the complete absence of empirical evidence about the positive or negative impacts of touchscreen devices on early cognitive development, initial research must be to go beyond anecdotal reactions and unfounded marketing claims, to identify correlations between touchscreen usage and development, when various important factors (such as socioeconomic status) are controlled for. Only once these associations have been established can scientifically informed guidelines be developed.

At Birkbeck, we have embarked on such a project – TABLET (Toddler Attentional Behaviours and Learning with Touchscreens), which aims to document the role that touchscreen devices play in family life, as well as recording parental concerns about digital technology.

To learn more about the TABLET project (funded by the Leverhulme Trust to Dr Tim Smith, Birkbeck, in collaboration with Dr Rachael Bedford, Dr Irati Saez de Urabain and Professor Annette Karmiloff-Smith), go to www.bbk.ac.uk/tablet_project.

The researchers are inviting families worldwide to participate by completing a series of online questionnaires. The study is open to parents of infants and toddlers aged six to 36 months, whether their children use tablets or not. For families living near London, the two groups – users vs non-users – will undergo follow-up testing at Birkbeck's BabyLab to gain a detailed insight into possible differences in socio-cognitive and brain development.

The ultimate aim of the TABLET project is to provide an evidence base for parents, policymakers and scientists to understand how our youngest generation is currently developing in a media-filled environment, and to inform future policymaking with science rather than emotion.

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Touchscreen devices may actually generate heightened levels of cognitive activity compared to books and other toys

Even ICT apologists would surely concede that disordering the developing senses of a young child is not sensible

AGAINST

We have to proceed with caution to avoid a developmental catastrophe, says Dr Richard House, academic, chartered psychologist and campaigner on early childhood

As last month marked the 70th anniversary of the nuclear incineration of Hiroshima, Japan, and its 140,000 population, I begin by mentioning the recent open letter, signed by Professors Stephen Hawking and Noam Chomsky and thousands of others, making a formidable ethical case for an international ban of 'killer robots' with AI.

Their plea graphically illustrates how we cannot assume that technological and scientific 'progress' is always necessarily beneficent for humankind. This needs spelling out because I so often hear a refrain of helpless resignation about ICT – for example, 'Well, it's part of the modern world, so we just have to accept it and work with it.'

I profoundly disagree. Unthought-through ideological commitments to technology are extremely dangerous. It's an empirical and a developmental question as to whether ICT is appropriate for young children, and never something that we should blindly accept through robotic adherence to the new cultural myth that technology is always and necessarily a progressive force.

UNNECESSARY...

A simple way to summarise the arguments against early ICT is to say that in early childhood, it is unnecessary, inappropriate, and harmful.

Unnecessary: children will learn any ICT-related skills far more easily when their fine motor skills are well developed – and by then, many current technologies will likely be redundant anyway.

Inappropriate: is it necessary or appropriate for children's early learning to be 'accelerated'? Many authorities are fundamentally ➤

What is it that makes ICT devices different from other toys?

questioning this common assumption.

Harmful: apart from the alarming research findings reviewed by psychologist Dr Aric Sigman on ICT's negative health effects (see 'More information'), a core aspect of early experience is learning to be human. The real, human-relational and natural world is challenging for all human beings to understand. To confuse children when they have hardly begun to get a handle on this world, by introducing them to virtual, techno-magical worlds, is surely an absurd reversal of the natural order of things.

I will flesh out these arguments by focusing on just three themes.

THEMES

1. Sensory development

Psychologists Sardello and Sanders have detailed how the delicate, infinitely subtle process of sense development is easily disrupted – summed up beautifully in their pithy warning that 'the senses become disordered when too much of a simulated world is inserted between our body and the surrounding world.'

ICT, or electronic media, leads to indirect and distorted experience of the world (precisely the definition of media – a re-rendering of reality). Moreover, electronic images do not offer the developing child the rich array of experience, for the stimuli are flat and flashy, and restricted to just two sense modalities (hearing and seeing).

Even ICT apologists would surely concede that disordering the developing senses of a young child is not sensible – and there exist vastly contrasting views on the human senses (even in terms of how many there are). So with science so divided, and ultimately ignorant about human sense development, precaution must surely prevail.

2. The fullness and complexity of human experience

Quick-fix ICT-driven experiences are surely the last thing young children need on their learning journey about the complexities and vicissitudes of becoming a human being. Contested viewpoints abound in the field of human development, from an entirely materialistic perspective at one extreme, through psychoanalytic and cognitivist perspectives, and thence to spiritually informed cosmologies.

Frankly, it is grossly irresponsible, verging on arrogance, for one limited view of science first to assume its correctness, and then to impose practices derived from its own narrow perspective on young children. The 'precautionary principle' should always hold sway. And if there's any doubt at all, we should place trust in natural-world development, about which we possess considerable research-based evidence, rather than ICT and machine-mediated development, for which research is still in its infancy.

Further, developmentally, the highly complex negotiation between inner and outer worlds is fraught with difficulty – and it's made all the more complex when we factor in psychoanalytic perspectives (by Klein, Isaacs, Winnicott, etc).

Humans are routinely addicted to seeking distractions from our own being – and to give young children direct access to such technology-mediated forms of distraction is to risk severely limiting and skewing their developmental negotiation of, and learning about, the complexities of inner and outer worlds. Just because the capturing of these developmental subtleties may not be possible via empirical research does not mean they should be ignored.

3. Precocious, one-sided development and 'accelerationism'

Psychologist Donald Winnicott illustrated graphically how children, because of early environmental deficiency or failure, sometimes have to develop their mind prematurely as a survival response.

Such children often grow up to have all manner of physical, psychological and psychosomatic health problems. Psychoanalysts Corrigan and Gordon term this phenomenon the 'mind object', and to expose young children to ICT technologies is to risk generating the very kind of 'mind-object', life-long psychopathologies that these psychologists have exhaustively outlined, based on their clinical work. Precaution again, please!

I'm amazed at how it's often routinely assumed that it is somehow helpful and appropriate to accelerate young children's learning (distortions of Vygotsky have a lot to answer for here). This 'modernist' ideology is doing more harm to our children than just about anything else, and introducing young children to ICT is surely the epitome of such unwarranted accelerationism. For as Max Frisch presciently put it, 'Technology radically accelerates human experience.'

SPEECHLESS

I've not even touched here on the many existing socio-cultural critiques of these technologies, nor on the displacement effects to which they give rise. But in the light of the foregoing, I find deeply disturbing any suggestion that it might be appropriate for babies and toddlers to have access to iPads. What about the American Academy of Paediatrics' recommendation that children under two shouldn't use screen-based technology at all (and that older children's access should also be limited)?

Infinitely more responsible is the recent frank admission of ICT researcher at De Montfort University, Dr Lee Hadlington, that 'we don't know what's actually happening to our cognition when we are using this technology and that's the important thing'. And if this is the case with adults, how much more is it relevant to young children whose brains are still at very early stages of development.

It seems that the arrogance of modern technology (together with ruthless commercialism) knows no bounds. On the basis of what I've argued here, giving iPads to babies is tantamount to child abuse. It's akin to playing Russian roulette with children's development, fuelled by people who either have a cynical commercial interest, or are hopelessly caught up in the mesmerising ideology of technocratic modernity – or both.

As my colleague Professor Sebastian Suggate has it in a memorable epigram, 'ableness is not readiness'. We urgently need to cultivate the developmental insight and pedagogical wisdom to tell the difference between the two, before our settings are swamped by what is a rapidly unfolding, commercially-driven technological catastrophe.

MORE INFORMATION

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Complete references for both 'For' and 'Against' are at www.nurseryworld.co.uk.' ■