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Abstract

Introduction

Children are beginning to use digital technologies at younger and younger ages. The emerging trend of very young children (babies, toddlers and pre-schoolers) using Internet connected devices, especially touch screen tablets and smartphones, has elicited polarising opinions from early childhood experts.

At present there is little actual research about the risks or benefits of tablet and smartphone use by very young children. Current usage recommendations, based on research into passive television watching which claims that screen time is detrimental, is in conflict with advice from education experts and app developers who commend interactive screen time as engaging and educational.

Guidelines from the health professions typically advise strict time limits on very young children's screen-time. Based for the most part on policy developed by the American Academy of Paediatrics, it is usually recommended that children under two have no screen time at all (Brown), and children over this age have no more than two hours a day (Strasburger, et al.).

On the other hand, early childhood education guidelines promote the development of digital literacy skills (Department of Education). Further, education-based research indicates that access to computers and the Internet in the preschool years is associated with overall educational achievement (Bittman et al.; Cavanaugh et al; Judge et al; Neumann). The US based National Association for Education of Young Children's position statement on technology for zero to eight year-olds declares that "when used intentionally and appropriately, technology and interactive media are effective tools to support learning and development" (NAEYC).

This article discusses the notion of *Digitods*—a name for those children born since the introduction of the iPhone in 2007 who have ready access to touchscreen technologies since birth. It reports on the limited availability of evidence-based research about these children's ICT use concluding that current research and recommendations are not grounded in the everyday life of very young children and their families.

The article then reports on the beginnings of a research project funded by the Australian Research Council entitled *Toddlers and Tablets: exploring the risks and benefits 0-5s face online*. This research project recognises that at this stage it is parents who "are the real experts in their toddlers' use of screen technologies. Accordingly, the project's methodological approach draws on parents, pre-schoolers and their families as communities of practice in the construction of social meaning around toddlers' use of touch screen technology.

Digitods

In 2000 Bill Gates introduced the notion of *Generation I* to describe the first cohort of children raised with the Internet as a reality in their lives. They are those born after the 1990s and will, in most cases;

> have no memory of life without the Net. […] Generation I will be able to conceive of the Internet's possibilities far more profoundly than we can today. This new generation will become agents of change as the limits of the Internet expand to include educational, scientific, and business applications that we cannot even imagine. (Gates)

Digitods, on the other hand, is a term that has been used in education literature (Leathers et al.) to describe those children born after the introduction of the iPhone in 2007. These children often begin their lives with ready access to the Internet via easily usable touch screen devices, which could have been designed with toddlers' touch and swipe movements in mind. Not only are they the youngest group of children to actively engage with the Internet they are the first group to grow up with a range of mobile Internet devices (Leathers et al.).

The difference between *Digitods* and Gates's *Generation I* is that *Digitods* are the first pre-verbal, non-ambulant infants to have ready access to digital technologies. Somewhere around the age of 10 months to fourteen months a baby learns to point with his or her forefinger. At this stage the child is ready to swipe and tap a touch screen (Leathers et al.). This is in contrast to laptops and PCs given that very young children often need assistance to use a mouse or keyboard.

The mobility of touch screen devices allows very young children to play at the kitchen table, in the bedroom or on a car trip. These mobile devices have, of course, a myriad of mobile apps to go with them.

These apps create an immediacy of access for infants and pre-schoolers who do not need to open a web browser to find their favourite sites. In the lives of these children it seems that it has always been possible to touch and swipe their way into games, books and creative and communicative experiences (Holloway et al. 149).

The interactivity of most pre-school apps, as opposed to more passive screen activities such as watching television shows or videos (both offline or online), requires toddlers and pre-schoolers to pay careful attention, think about things and act purposefully (Leathers et al.). It is this interactivity which is the main point of difference, one which holds the potential to engage and educate our youngest children.

It should be noted within this discussion about *Digitods* that, while the trope *Digital Natives* tends to homogenise an entire generation, the authors do not assume that all children born today are *Digitods* by default. Many children do not have the same privileged opportunities as others, or the (parental) cultural capital, to enable access, ease of use and digital skill development. In addition to this it is not implied that *Digitods* will be more tech savvy than their older siblings. The term is used more to describe and distinguish those children who have digital access almost since birth—in order to differentiate or tease out everyday family practices around these children's ICT use and the possible risks and benefits this access affords babies, toddlers and pre-schoolers.

While the term *Digital Native* has also been criticised as being a white middle class phenomenon this is not necessarily the case with *Digitods.* In the Southeast Asia and the Pacific region developed countries like Japan, Korea, New Zealand and Singapore have extremely high rates of touchscreen use by very young children (Child Sciences; Jie; Goh; Unantenne). Other countries such as the Philippines and Indonesia have moved to a high smart phone usage by very young children while at the same time have only nascent ICT access and instruction within their education systems (Unantenne).

The Digitod Parent

Parents of *Digitods* are usually experienced Internet users themselves, and many are comfortable with their children using these child-friendly touch screen devices (Findahl). Digital technologies are integral to their everyday lives, often making daily life easier and improving communication with family and friends, even during the high pressure parenting years of raising toddlers and pre-schoolers.

Even though many parents and caregivers are enabling very young children's use of touch screen technologies, they are also concerned about the changes they are making. This is because very young children's use of touch screen devices "has become another area where they fear possible criticism and in which their parental practices risk negative evaluation by others" (Holloway et al). The tensions between expert advice regarding young children's screen-time and parents' and caregivers' own judgments are also being played out online. Parenting blogs, online magazines and discussion groups are all joining in the debate:

> On the one hand, parents want their children to swim expertly in the digital stream that they will have to navigate all their lives; on the other hand, they fear that too much digital media, too early, will sink them. Parents end up treating tablets like precision surgical instruments, gadgets that might perform miracles for their child's IQ and help him win some nifty robotics competition—but only if they are used just so. (Rosin)

Thus, with over 80 000 children's apps marketed as educational in the Apple App Store alone, parents can find it difficult to choose apps that are worth purchasing (Yelland). Nonetheless, recent research regarding Australian children shows that three to five year olds who access touch screen devices will typically have five or more specific apps to choose from (5.23 on average) (Neumann).

With little credible evidence or considered debate, parents have been left to make their own choices about the pros and cons of their young children's access to touch screens. Nonetheless, one immediate benefit that comes to mind is toddlers and pre-schoolers video chatting with dispersed family member—due to increased globalisation, guest worker arrangements, FIFO (fly-in fly-out) workforces and family separation or divorce. Such clear benefits around sociability and youngsters' connection with significant others make previous screen-related guidelines out of date and no longer contextually relevant.

Little Research Attention

Family ownership of tablet devices as well as touch screen phones has risen dramatically in the last five years. With very young children being loaned these technologies by mum or dad, and a tendency in Australia to rely on market-orientated research regarding ownership and usage, there is very little knowledge about touch screen usage rates for very young Australian children.

UK and US usage figures indicate that over the last few years there has been a five-fold increase in tablet uptake by zero to eight year olds (Ofcom; Rideout). Although large scale, comparative Australian data is not available, previous research regarding older children indicates that Australia is similar to high use countries like some Scandinavian nations and the UK (Green et al.). In addition to this, two small research projects in Australia, with under 160 participant families each, indicate that two thirds of these children (0-5) use touchscreen devices (Neumann; Coenenna et. al.).

Beyond usage figures, there is also very limited evidence-based research about very young children's app use. Interactive technologies available via touch screen technologies have been available domestically for a very short time. Consequently, "valid scientific research has not been completed and replicated due to [the lack of] available time" (Leathers el al. 129) and longitudinal studies which rely on an intervention group (in this case exposure to children's apps) and a control group (no exposure) are even fewer and more time-consuming.

Interestingly, researchers have revisited the issue of passive screen viewing. A recent 2015 review of previous 2007 research, which linked babies watching videos with poor language development, has found that there was statistical and methodological issues with the 2007 study and that there are no strong inferences to be drawn between media exposure and language development (Ferguson and Donellan).

Thus, there seems to be no conclusive evidence-based research on which to inform parents and educators about the possible downside or benefits of touch screen use. Nonetheless, early childhood experts have been quick to weigh in on the possible effects of screen usage, some providing restrictive guidelines and recommendations, with others advocating the use of interactive apps for very young children for their educational value.

This knowledge-gap disguises what is actually happening in the lives of real Australian families. Due to the lack of local data, as well as worldwide research, it is essential that Australian researchers obtain a comprehensive understanding about actual behaviour around touch screen use in the lives of children aged between zero and five and their families.

Beginning Research

While research into very young children's touch screen use is beginning to take place, few results have been published. When researching two to three year olds' learning from interactive versus non-interactive videos Kirkorian, Choi and Pempek found that "toddlers may learn more from interactive media than from non-interactive video" (Kirkorian et al). This means that the use of interactive apps on touch screen devices may hold a greater potential for learning than passive video or television viewing for children in this age range.

Another study considered the degree to which the young children could navigate to and use apps on touch screen devices by observing and analysing YouTube videos of infants and young children using touch screens (Hourcade et al.). It was found that between the ages of 12 months and 17 months the children filmed seemed to begin to "make meaningful use of the tablets [and] more than 90 per cent of children aged two [had] reached this level of ability" (1923).

The kind of research mentioned above, usually the preserve of psychologists, paediatricians and some educators, does not, however, ground very young children's use in their domestic context—in the spaces and with those people with whom most touch screen usage takes place. With funding from the Australian Research Council Australian, Irish and UK researchers are about to adopt a media studies (domestication) approach to comprehensively investigate digital media use in the everyday lives of very young children.

This Australian-based research project positions very young children's touch screen use within the family and will help provide an understanding of the everyday knowledge and strategies that this cohort of technology users (very young children and their parents) have already developed—in the knowledge vacuum left by the swift appropriation and incorporation of these new media technologies into the lives of families with very young children.

Whilst using a conventional social constructionist perspective, the project will also adopt a co-creation of knowledge approach. The co-creation of knowledge approach (Fong) has links with the communities of practice literature (Wegner) and recognises that parents, care-givers and the children themselves are the current experts in this field in terms of the everyday uses of these technologies by very young children. Families' everyday discourse and practices regarding their children's touch screen use do not necessarily work through obvious power hierarchies (via expert opinions), but rather through a process of meaning making where they shape their own understandings and attitudes through experience and shared talk within their own everyday family communities of practice.

This *Toddlers and Tablets* research is innovative in many ways. It seeks to capture the enthusiasm of young children's digital interactions and to pioneer new ways of 'beginnings' researching with very young children, as well as with their parents. The researchers will work with parents and children in their broad domestic contexts (including in and out-of-home activities, and grandparental and wider-family involvement) to co-create knowledge about young children's digital technologies and the social contexts in which these technologies are used.

Aspects of these interactions, such as interviews and observations of everyday digital interactions will be recorded (audio and video respectively). In addition to this, data collected from media commentary, policy debates, research publications and learned articles from other disciplinary traditions will be interrogated to see if there are correlations, contrasts, trends or synergies between parents' construction of meaning, public commentary and current research. Critical discourse tools and methods (Chouliaraki and Fairclough) will be used to analyse verbatim transcripts, video, and all written materials.

Conclusion

Very young children are uniquely dependent upon others for the basic necessities of life and for the tools they need, and will need to develop, to claim their place in the world. Given the ubiquitous role played by digital media in the lives of their parents and other caregivers it would be a distortion of everyday life for children to be excluded from the technologies that are routinely used to connect with other people and with information.

In the same way that adults use digital media to renew and strengthen social and emotional bonds across distance, so young children delight in 'Facetime' and other technologies that connect them audio-visually with friends and family members who are not physically co-present. Similarly, a very short time spent in the company of toddlers using touch screens is sufficient to demonstrate the sheer delight that these young infants have in developing their sense of agency and autonomy (https://www.youtube.com/watch?v=aXV-yaFmQNk).

Media, communications and cultural studies are beginning to claim a space for evidence based policy drawn from everyday activities in real life contexts. Research into the beginnings of digital life, with families who are beginning to find a way to introduce these technologies to the youngest generation, integrating them within social and emotional repertoires, may prove to be the start of new understandings into the communication skills of the preverbal and preliterate young people whose technology preferences will drive future development – with their parents likely trying to keep pace.

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