



Young children have opportunities for play and pedagogy in digital contexts. Play and pedagogy involve children using a range of digital devices for exploration, meaning-making, collaboration and problem-solving. Educators engage in active decision making about the use and non-use of digital technologies for learning.

4.1 Digital play

Play is an established part of early childhood education. Educators understand that open-ended and exploratory play by children provides opportunities for children to explore ideas, experiment with materials and engage with other people for learning (Pyle, DeLuca & Danniels, 2017). Both indoor and outdoor play are important for young children's learning and development. Through play, children build language skills, engage in social interactions, develop concepts about the world and experience physical and cognitive challenges. Educators engage with children during play using strategies such as modelling, questioning, discussions and conversations to build their knowledge, skills and capabilities (Wood, 2010).

Digital play involves children in many combinations of activities using a range of digital and non-digital resources, either by themselves or in collaboration with others. Children may create and share digital content using software and apps, make their own videos, access digital content to inform their learning or play scenarios, deploy digital time-keepers in running races or obstacle courses, use digital microscopes, access apps for physical activity games, download music for singing and dancing, or re-enact their favoured popular-culture characters from digital media.

Sometimes young children are described as 'digital natives' with a natural aptitude for using digital technologies. Research shows that this is not the case (Bennett, Maton & Kervin, 2008). Children learn to use digital technologies in

the same way they learn in other areas of the curriculum, such as language and literacy, science and mathematics. Exploratory play, observations of adults using digital technologies, and social interactions with knowledgeable peers, siblings, co-players and adults help build children's knowledge and expertise in using digital technologies (Marsh, Hannon, Lewis & Ritchie, 2017).

Exploratory play is how children learn the properties of materials. When using traditional materials, this refers to children becoming familiar with the texture, function, surface and colour of materials such as paint, paper, clay, sand, textas (markers) and glue. In digital contexts, exploratory play involves children becoming familiar with how the different functions on digital technologies operate (Bird & Edwards, 2015). For example, video and audio recording; taking digital photographs; storing, retrieving and printing data; and 2D and 3D printing. When children repeatedly press buttons or use the same function over and over, it is part of the exploratory play they engage in to learn how to apply the functions of digital technologies for different purposes. For example, it is difficult for a child to create a digital film when they have not yet learned how to start and stop the 'record' button. Educators can support children during exploratory digital play by showing them how different functions operate. Shared joint attention between children and adults when using digital technologies is important in this learning (Kervin, 2016).

In early childhood education and care settings, children also learn to use digital technologies by playing with objects that represent digital technologies, such as pretend phones, touchscreen tablets or scanners (Bird, 2017). Educators can use multiple materials for this type of play. Some may be purpose-designed, pretend digital technologies. Others might be simpler, such as a block or cardboard box that children pretend is a phone or touchscreen device, and use it to enact sending a text message to a friend. Educators can join in this play by responding to the text message using

their own 'block' mobile phone. This type of digital play builds opportunities for children and educators to understand the social uses of digital technologies (Yelland, 2011).

4.2 Digital technologies in play and learning

Touchscreen devices (smartphones and tablets) are among the digital technologies that are most commonly used by children. Popular images of young children and digital technologies often feature touchscreen technologies. These technologies incorporate icons, and audio and visual instructions that are readily interpreted by young children and can be operated using their fingertips (Geist, 2012). The inherent user-friendliness of touchscreen technologies has led to a rapid uptake in their use among young children worldwide (Lauricella, Blackwell & Wartella, 2017). Educators can make decisions about how, when and for what periods of time young children use touchscreen devices. Current advice suggests that children aged two years and under should mostly use screen technologies for video-chatting (McClure, Chentsova-Dutton, Barr, Holochwost & Parrott, 2015). For children aged two to five years, advice suggests a limit of one hour of sedentary screen time per day (AAP Council on Communications and Media, 2016; Australian Government, 2017).

Preschool aged children in early childhood education and care settings can benefit from touchscreen technology use that involves the considered use of apps. Apps have various levels of quality and educational design. Educators can consider how different apps meet the play interests of children in their classrooms or create new opportunities for children to mix and match modes of communication in digital form, such as video, audio, images and text. This is important for sustaining the quality of children's in-app digital play (Troseth, Russo & Strouse, 2016). Quality apps and digital content can support learning through well-structured narratives and activities that promote problem-solving and reasoning (Herodotou, 2018; Hirsh-Pasek et al., 2015). Appropriate apps and other digital content for children will also contain pro-social content, be non-violent, promote gender and cultural diversity, and have low levels of advertising. Content that is too

fast-paced for young children can negatively influence executive function (Lillard & Peterson, 2011; Lillard, Drell, Richey, Boguszewski & Smith, 2015).

Young children's learning using touchscreen devices can be maximised by educators through joint media engagement (Takeuchi & Stevens, 2011). Joint media engagement involves children, peers and/or adults participating in digital activities together, for example, co-playing games and apps, or co-viewing digital content. When children experience joint media engagement they can ask questions, put forward ideas and receive feedback from adults and other children in relation to a common activity. This helps build opportunities for language development and fosters collaborative learning (Neumann & Neumann, 2013). Joint media engagement reminds adults that young children do not just use touchscreen technologies to consume digital content or play games and apps. Research shows that young children use touchscreen technologies for different purposes—many of which can be described as playful, collaborative and interactive (Marsh, Plowman, Yamada-Rice, Bishop & Scott, 2016). For example, viewing digital media can inspire young children's play narratives; support them to create new digital and non-digital images through painting, drawing, photography and video; and enable peer relationships by sharing digital media of common interest.

Beyond touchscreen devices, the range of digital technologies used by young children is extensive. Research shows that young children use desktop and laptop computers, game consoles, digital toys, robots, 3D printers, coding toys, wearables, voice-activated technologies, Internet of Toys and haptics (Druga, Breazeal, Williams & Resnick, 2017; Goldstein, 2011). Children themselves describe digital technology use in active terms, using words such as 'learn', 'make', 'build', 'paint', 'write', 'watch' and 'feel' to explain what they do with them (Mertala, 2016). This active positioning connects with the idea that digital play in early childhood provides opportunities for exploration and experimentation (Fleer, 2014; Leinonen & Sintonen, 2014). For example, children and educators might take apart and reassemble

discarded technologies to see how they operate. They might also use programmable robots as a hands-on digital technology experience. Children can touch and observe this technology, responding to the coding they create. When the robot responds in a way unintended by the child's coding, an educator and child can problem-solve the coding together—why does the robot appear to be turning the wrong way? This promotes computational thinking, which involves identifying problems, and proposing and testing solutions to those problems (Bers, Flannery, Kazakoff & Sullivan, 2014).

Digital media enjoyed by young children, such as television programs, movies or online content can inform complex play narratives that children enact within their early childhood education and care settings (Wohlwend, 2015). These narratives may involve children in high-level physical activity (e.g. running, climbing, chasing, jumping and leaping when playing superheroes). Digital re-enactment also provides opportunities for children to create their own play resources, such as 2D or 3D print-outs of characters; drawing, photographing or painting background landscapes; designing and fashioning costumes; and/or digitally recording themselves as characters. This helps children to appreciate the range of digital technologies available for meaning-making and sharing ideas with other people.

4.3 Digital pedagogy

A hallmark of being an early childhood educator is the capacity to make informed decisions that are in the best interests of young children. Early childhood educators are equipped with professional knowledge about how young children play, learn and develop. They understand the importance of social engagement and building strong relationships with children. They apply this knowledge and understanding to provide children with play opportunities and experiences that support children in the achievement of learning outcomes aligned with the *Early Years Learning Framework: Identity, Connected and Contributing, Wellbeing, Confident and Involved, and Effective Communicators* (DEEWER, 2009). When educators support children in these learning outcomes, they make pedagogical

decisions about what, how, where and why children engage in different play experiences and activities.

Digital pedagogy involves educator decision making about using digital technologies with, by and for young children. This can include the decision to not use digital technologies with children in certain situations. For example, it is important that young children have opportunities to experience outdoor play without digital technologies. It is also appropriate that activities such as painting, drawing, book-reading or sharing cultural rhymes are experienced by children and educators alike without always using digital technologies. At other times, educators might decide to use digital technologies because they are the most appropriate way of helping children to develop and communicate an idea, access information required to progress play, to develop an inquiry-based project, or learn about networked technologies for cyber-safety education. Sometimes children may benefit from a brief period of rest and relaxation, enabled using digital technologies, such as viewing digital media or enjoying a favourite app. While joint media engagement is beneficial for children's learning, and sitting with screens is part of children's daily sedentary time, a short period of supervised digital technology use (such as viewing digital media or playing with an app) can be a pedagogical decision made by educators according to the best interests of the child. Educator modelling of decision making regarding the use and non-use of digital technologies helps children learn how to balance a range of digital and non-digital experiences and activities within their own lives.

Principle: Play and pedagogy promotes young children's exploration, social interaction, collaboration and learning in digital contexts

Practice advice:

1. Provide opportunities for children to explore and experiment with the functions of a diverse range of digital technologies alongside adult modelling and instruction in digital technology use.
2. Promote play involving children in digital technology use with digital and non-digital tools and materials to build knowledge about the use of technologies for communication, collaboration and information sharing.
3. Seek young children's perspectives regarding the role and use of digital technologies in their own lives, play and learning.
4. Model active decision making regarding digital technology use with, by and for young children that provides a balance of digital and non-digital experiences and activities in early childhood education and care settings.