‘Freedom to experiment’: Educators and parents reflecting on children’s creativity with technologies

Katie Fielding and Karen Murcia
Curtin University, Australia

Digital technologies present a powerful opportunity for supporting young children’s creativity development. However, educators and parents often feel uncertain about their place in early learning. As such, opportunities they present in facilitating and encouraging creativity may go unrealised. Drawing on ten semi-structured, artefact-stimulated interviews with educators and parents of young children (4 to 8-years-old) in Perth, Western Australia, this study employed thematic analysis to investigate the attitudes held towards creativity and digital technologies in early learning. Findings demonstrate broad enthusiasm for the opportunities technologies present despite relevant concerns. Adult participants recognised some aspects of children’s creativity when using technologies but others, such as persistence, were overlooked. Notably, young children were unable to articulate their own understanding of creativity. Developing a shared language for discussing creativity may assist educators and parents to provide rich experiences for intentional creativity development while using technologies. Recommendations include the development of supportive tools and professional learning opportunities focused on the nexus of creativity and digital technologies to assist educators and parents in harnessing the opportunities digital technology presents for young children’s creativity development.

Introduction

There is a clear mandate presented by curriculum and policy frameworks, including *The United Nations Conventions on the Rights of the Child, General Comment Number 25* (United Nations Committee on the Rights of the Child, 2021) regarding the rights of the child in an increasingly digitised modern world. Young children have a right to participate in their world with agency, equipped with tools to facilitate their personal and social development and to contribute to society. An important tool for successfully navigating life in the 21st century is creativity (World Economic Forum, 2023). Given these concurrent priorities, the development of young children’s creativity through digital technology use is vital. Evidence shows digital technologies can facilitate the development of children’s creativity (Fielding & Murcia, 2022) and research demonstrates young children are engaging with digital technologies to a significant extent (Mantilla & Edwards, 2019; Zabatiero et al., 2018). As such, there is substantial opportunity to harness the potential of digital technologies in developing young children’s creativity. However, uncertainty remains regarding their integration into early learning. As noted by Minicozzi (2018), many early childhood educators may be reluctant to incorporate technologies into the learning environment when they know children are potentially using such technologies for extended periods at home as well.

Educators and parents of young children often receive conflicting messages about the use of digital technologies. As the primary mediators of children’s technology use, parental

attitudes shaped by such messaging are strong influences on the opportunities children are given to engage with digital technologies in the early years (Wilson et al., 2024). In Australia, both the *Early Years Learning Framework* (Australian Government Department of Education, 2022), the national framework for early learning programs, and the *National Quality Framework* (Australian Children's Education & Care Quality Authority, n.d.) for regulating early learning and school-aged care, specifically refer to digital technologies. Children are often drawn to robotics and coding, and intentional use of these technologies can be beneficial for their learning (Crawford, 2023). Yet, the potentially negative impacts of young children's digital technology use persist and many guidelines (e.g., the United States: American Academy of Pediatrics Council on Communications and Media, 2016; Australia: Australian Government Department of Health, n.d.; New Zealand: Ministry of Health, 2017) suggest their use be significantly limited if used at all. Such conflicts can make embracing digital technologies difficult for educators and parents, despite recognising their potential.

Early childhood is a critical period for developing creative thinking due to prolific growth of neural pathways occurring at this time (Leggett, 2017). Furthermore, the learning environment, including the pedagogies and practices employed within, are fundamental to children's creativity development (Henriksen et al., 2021). Understanding what creativity is and how it can be demonstrated by young children may impact opportunities educators and parents provide for creativity development (Gao & Hall, 2024). Similarly, attitudes about the type and amount of digital technology use appropriate for young children can create barriers to (or enable) their presence in early learning environments. As such, this study aims to consider what these attitudes are and how they may be influencing opportunities provided to young children. Understanding how creativity is recognised and attitudes towards digital technologies manifest when parents and educators observe young children engaging with technology may enable development of tools, resources and frameworks to support the vital role they play in children's creativity development.

Children's creativity

Definitions of creativity have developed from seminal works such as Rhodes' (1961) *Four Ps of Creativity,* which provided the framework for understanding creativity as the nexus of the Person, Process, Press and Product. Amongst differing views of creativity there is general consensus that creativity requires both novelty and utility (Runco & Jaeger, 2012). However, the way in which these qualities manifest in the creativity of children and adults is often different. What may be considered 'new' for a young child will likely not be thought of as such by an adult and the types of problems and challenges adults and children engage with are frequently different. For this reason, previous categorisations of 'Big C' (that of those eminent in their field) and 'Little C' creativity (that which is not genius or masterful, but which demonstrates innovation) were problematic in the context of early childhood (Kaufman & Beghetto, 2009). In response, Kaufman and Beghetto suggested a categorisation of 'mini-c' creativity, relating to transformative learning which "encompass[es] the creativity inherent in the learning process" (2009, p. 3). Mini-c creativity allows the recognition of a child's idea, approach or product as not objectively

new, but *new to them*. It also allows us to recognise activities such as persistence, trial-and-error and 'having a go' as creative behaviours in children. As suggested by Beghetto and Kaufman (2014), by having a clear conceptualisation of creativity and an understanding of what it might 'look' and 'feel' like when displayed by young children, educators and parents may be better able to facilitate its development. Murcia et al.'s (2020) *A-E of Creativity* provides a framework designed for educators, parents and researchers to recognise and encourage creative behaviours in early learning.

Digital technologies and children's creativity

Research has demonstrated digital technologies can be used to encourage development and demonstration of creativity (Chen & Ding, 2024; Fielding & Murcia, 2022). Digital technologies may provide easily accessible resources to support children's curiosity (Murcia & Tang, 2019; Berson et al., 2019; Yelland & Gilbert, 2018) as well as prompting them to make predictions and engage in 'what if' thinking (Falloon, 2016). The design of the technology, such as the insect-styling of *Beebots* or the anthropomorphic nature of *Cubetto* can prompt imaginative play (Tang et al., 2024; Newhouse et al., 2017). Programs designed specifically for the needs of young children, such as *ScratchJr*, have been found to be particularly well-suited to encouraging young children's computational thinking development (Stamatios, 2024). Children in several studies considered by Fielding and Murcia (2022) were engaged in peer-to-peer collaborations facilitated by technologies. Research shows children demonstrating resilience and persistence (Murcia & Tang, 2019; Kewalramani et al., 2020; Murcia et al., 2020) debugging and problem-solving (Bers et al., 2014; Burleson et al., 2018; Falloon, 2016), and daring to be different (Fessakis et al., 2013; Kewalramani et al., 2020). As such, increasing evidence exists demonstrating technologies can be a useful tool in developing young children's creativity.

The way in which children's creativity is conceptualised is important in its recognition (Massey et al., 2026). For example, the inefficiencies of trial-and-error approaches may be considered purposeless (e.g., Newhouse et al., 2017) and it is unlikely children will be demonstrating the same sort of creativity expected of adults. A reductive understanding of creativity may lead to overlooking the creative thinking and behaviours of which young children are capable (Fielding et al., 2023). As such, understanding the ways educators and parents recognise creativity in young children is valuable.

Concerns around young children's technology use

Although research suggests digital technologies can be beneficial in the development of children's creativity, concerns about how they may impact children's social, cognitive and physical development may result in reluctance to introduce them into early learning. Concerns about screen time have been raised for many years, emerging after the development of dedicated children's television in the 1970s and continuing as programming of this nature has increased (Courage, 2017). Parents and educators are often instructed that long periods of unsupervised screen time can lead to problems with language development, attention, school readiness, and decision making (e.g., Australian

Government Department of Health, n.d.). Many screen time restriction guidelines, and educator and parent attitudes (Zabatiero et al., 2018) stem from concern about the activities it will replace, such as one-on-one time with family, socialising, physical activity and traditional play (Dardanou et al., 2020; Teichert, 2020). Domingues-Montanari (2017) mentioned screen time as being an "important modifiable risk factor" (p. 334), implying it provides no particular benefit and is therefore more easily discarded than other sedentary activities. There is some agreement in the research that screen time around bedtime can be detrimental to children's sleep (Lund et al., 2021), reflected in guidelines recommending screens not be used in bedrooms and around bedtime. Some research suggests a negative impact of increasing amounts of screen time on children's eyesight (Alah et al., 2025) and language outcomes (Porter et al., 2026) though others have suggested it is a risk factor rather than a direct cause (Brushe et al., 2024; Harrington et al., 2022; Yang et al., 2022). As noted by Janssen et al. (2020), guidance provided to educators and parents is often overfocused on television-based screen time with little examination of more up-to-date devices such as tablets or smartphones.

Children's play is not restricted to *either* digital *or* analogue (Flint & Adams, 2023). Children frequently and fluidly move between both, yet guidelines often treat these as entirely separate activities. Further, using digital technologies is often considered a passive activity. However, 'exergames' – video games incorporating physical movement into game play (e.g., *Just Dance*, *Mario Party*, *Wii Sports*) can have physical, social and cognitive benefits (López-Serrano et al., 2021). Smits-Engelsman et al. (2017) suggested exergames could be beneficial by providing opportunities to participate in relatively low-cost, safe physical activities in spaces which can be private and free of judgement. Multiplayer and cooperative game play and mobile learning can provide opportunities for social interaction (Clemente-Suárez et al., 2024; Vella et al., 2019). The touchscreen technology incorporated into tablets and smartphones can provide access to activities which would otherwise be difficult due to children's developing fine motor skills and dexterity (O'Connor, 2017). Wilson et al. (2024) found positive parental attitudes towards digital technologies were influenced by whether technologies could be safely managed and the purposes for which they were used. As such, a focus on risk reduction and the possibilities for educative, social and developmentally appropriate uses of technologies could help parents and educators feel empowered to more fully integrate these tools into early learning.

The study

This study is part of a larger project conducted within the ARC Centre of Excellence for the Digital Child. The project takes a mixed-methods, multiple case study approach with five children each serving as a case (see Fielding & Murcia, 2022; Fielding et al., 2023; Fielding et al., 2025). This study aimed to explore attitudes educators and caregivers have towards the use of digital technologies, particularly in the context of creativity in early learning. The research questions were posed:

1. What are educator and parent attitudes to the use of digital technologies in the early learning environment?

2. What creativity do educators and parents recognise in young children's use of digital technologies?

Ethics

Ethics approval was granted by the researchers' university (HREC2021-0358). Written consent was obtained from educators, parents, and children. Immediately prior to the video-recorded observation and interview, children's written consent was again sought. Ongoing consent was monitored via a 'thumbs up/down' consent-indicator during each session. To ensure children were continually aware of being observed and recorded, large brightly coloured 'smiley faces' were affixed to cameras. The wider project in which this study is situated was intentionally designed with children's agency and voice foregrounded; pseudonyms were self-assigned by children and researcher-assigned for adults. As explored by Fielding et al. (2025), the children taking part in this study demonstrated their capacity to understand, grant and revoke their consent throughout.

Participants

Five participants (4-8 years old) were recruited by purposive convenience sampling (Merriam & Tisdell, 2009) via a parental 'opt-in' process. Participants were drawn from three early-learning contexts (two schools, one early learning centre) in the metropolitan area of Perth, Western Australia (Table 1).

Table 1: Participants in the study

Participants	Age	Context	Distance to Perth CBD(a)	IRSD score and quintile(b)
Rainbow and Alice	4	Early learning centre	10.5 km	1030 / 5
Hulk and Zelda	4	Kindergarten	50.5 km	989 / 3
Luna and Emily	5	Pre-primary	13.5 km	1070 / 5
Ella and Betty	5	Pre-primary	50.5 km	989 / 3
Luke and Jana	8	Year 2	13.5 km	1070 / 5

a. Distances rounded to nearest 0.5 km.
b. Index of Relative Socio-economic Disadvantage (IRSD) draws on a range of information about the economic and social resources of those living in a particular area. A low IRSD score indicates a greater proportion of disadvantaged people in an area. Quintiles range from 1 (most disadvantaged) to 5 (least disadvantaged). In 2021, the highest IRSD for Western Australia was 1097; the lowest was 855 (ABS, 2021).

Method

Audiovisual recordings of each child using digital technologies in their learning environment were made. These lasted between several minutes and an hour, depending on the nature of the activity and the child's engagement. Using the categories and examples articulated by Murcia et al.'s (2020) *A-E of Creativity* framework as criteria, several short excerpts demonstrating each child engaging with technologies creatively

were selected as prompts for artefact stimulated semi-structured interviews. These excerpts were intentionally chosen to ensure participants were provided with rich artefacts to interpret and respond to.

The artefact stimulated interviews employed were informed by Vasudevan and Riina-Ferrie's (2019) work. They suggest "eliciting stories and memories about artifacts can provide access to experiences, knowledge and even communities that may not be visible otherwise" (Vasudevan & Riina-Ferrie, 2019, p. 1564). The use of artefacts provided prompts for participants when reflecting on how young children interacted with technologies. The use of an artefact allowed the participant to offer their own perspectives and readings. Participants were empowered to respond to and offer interpretations of the artefacts, respecting their knowledge and experience (van Braak, 2018). Inspired by Rubin and Rubin's (2005) suggestion of main, follow-up and probing questions, interviews were conducted with pre-determined main questions, with less structured follow-up and probing questions incorporated into the conversation. This approach sought "depth and detail, vivid and nuanced answers, rich with thematic material" (p. 129).

Data analysis

A total of ten semi-structured interviews with the educator, and with the child and a parent were audio-recorded and transcribed. These interviews were thematically analysed following Braun and Clarke's (2022) six-phases of reflexive thematic analysis. Data were coded inductively with attention to attitudes towards technologies and creativity, informed by the research questions. From this initial reading, subsequent readings of the transcripts enabled identification of themes which were broken down into categories and subcategories, as shown in Table 2.

Findings

Trends in the data

Attitudes towards technologies

In the theme of *attitudes towards technologies*, a degree of ambivalence emerged. In all interviews, participants discussed both concerns and benefits they saw in technology use in early learning environments. Two participants explicitly stated they did not believe technologies should be used with this age group.

> *Ella's mother:* I don't like it. I'm not for technology at all. I think they should go out and play, not sit in the front of a screen... Yeah, I'm not for technology at school.
> *Hulk's mother:* I don't think it's necessary this year.

However, both also acknowledged the positive opportunities in doing so, such as being able to interact with educational apps and devices and being prepared for the future. Some educators also reflected on the potential for technologies to become a distraction.

Table 2: Themes, categories and subcategories derived from analysis of interview transcripts

Theme	Category	Subcategory (n)
Attitudes towards technologies	Concerns	Displacing other activities (7)
		Online safety (6)
		Behavioural/ emotional changes (5)
		Physical issues (4)
		Presenting a distraction (4)
		Information/digital literacy (2)
		Difficult/inappropriate for some children (2)
	Benefits	Preparing for their future (6)
		Access to information (4)
		Opportunities for expression/choice (4)
		Social interaction (4)
		Availability of educational tools (4)
		Convenience (3)
		Accommodating learning styles (2)
		Less laborious (2)
Recognising creativity	Conceptions of creativity	Problem solving (9)
		Individuality/ self-expression (8)
		Artistic expression (7)
		Imagination (6)
		Making choices (5)
		A mindset (3)
		Innovation (3)
		Building/ making (3)
		Sharing ideas (1)

Note: Numbers (n) in parentheses indicate within how many interviews (of a total 10) a subcategory was noted. Consistent with Braun and Clarke's (2022) reflexive thematic analysis process, the number does not indicate the frequency of utterances themselves.

> *Emily:* It did interfere with them getting their work done until I had to sort of lay in those guidelines… you first put your work in and then you do the play of putting it up.

Although having easy access to large amounts of information was discussed as a benefit (4 of 10), some participants (2 of 10) noted this could be problematic for young children with inadequate information literacy skills.

> *Jana:* I think it gives too much information and… children can be shifted in different opinions very quickly from what they read.

Many participants (6 of 10) acknowledged the importance of young children learning to use digital technologies as preparation for the future. Some framed this as an acceptance of an inevitability. Others spoke enthusiastically about the opportunities such technologies present.

> *Luna's mother:* And these kids are able to code, you know, robots moving around the classroom. That's phenomenal… being able to research things easier to find out

> more information, much easier than looking up through 20,000 books like we used to have to do.
> *Luke's mother:* … it's all they're going to be using when they're grownups, so it makes sense to use it now.

Most participants (7 of 10) raised concerns about technologies potentially displacing other activities and skills, such as developing their handwriting and playing outside. Some were concerned technology use may result in physical and behavioural issues.

> *Luna's mother:* I find that sometimes they get very tired.
> *Emily:* They said they've noticed… far more students needing glasses at this age because their distance muscles haven't had a chance to develop.
> *Hulk's mother:* I think it's… making their writing skills lack, and their spelling and things like that.

Concerns about online safety were frequently raised (6 of 10). Participants suggested there was potential for children to access inappropriate websites, videos and games even where preventative steps had been taken.

> *Alice:* I don't always trust that it has no other links… does anyone else have contact?

Technology being a useful tool for children to demonstrate their learning in diverse ways (2 of 10) and to provide opportunities for expression and choice (4 of 10) were noted.

> *Emily:* … it's just giving them that freedom to sort of experiment.
> *Jana:* The technology allows him to demonstrate his learning a lot more effectively.

Conceptions of creativity

In *recognising creativity*, participants frequently identified individuality or self-expression as a feature of being creative (8 of 10).

> *Alice:* It's more how people's minds work and their ideas and then being able to express them in different ways.
> *Hulk's mother:* They have a clever mind, or they see things differently.

Although most participants (7 of 10) noted artistic expression as being creative, this did not prevent them from recognising other forms of creativity; in all interviews where such creativity was discussed, other forms of creativity such as making choices, problem solving and being innovative were also raised.

> *Zelda:* There's people who've been creative in science, who've… made new inventions… So it's not necessarily an arts thing.

Despite the range of ideas raised, most parents and educators indicated they did not consider themselves particularly creative. Some suggested children were very creative as there were 'no rules' and individuality was more acceptable and encouraged during childhood.

Luke's mother: It's like making something that doesn't exist. It's only in your mind but you make it a reality with whatever you're feeling. No rules.
Rainbow's father: I think when you're grown up you have more limits… the creative ways in which one could react in a social situation are limited.

When asked about creativity generally, participants often identified it as a mindset (3 of 10) or 'having imagination' (6 of 10). Although each adult participant was able to provide a definition of creativity, this definition often lacked clear parameters or measures.

Luna's mother: Basically, using your imagination to do whatever you want to do. I don't think it's any particular thing. It can be writing, it can be making things that can be art, can be like nature, and finding ways to look after things and coming up with new ideas, new innovations.
Rainbow's father: I think it's being able to visualise it in your mind.

Despite this, when observing children using technologies some of the educators and parents noted specific aspects of the approach children took to the activities that were creative. Participants did not always include problem solving in their definition of creativity, but most identified it when viewing the children using technologies.

Zelda: There was a bit of trial and error in there to get to that point… he had to be creative to work out how to get this icon to where it needed to be.
Hulk's mother: I can see the creativity. I can see him problem solving. I can see him thinking trial, trial and error… You can tell that he has to think for himself.

Reflecting on doing the same activity Ella participated in with other classes, Betty observed the children took many different approaches and interacted with the technologies in different ways.

Betty: The three different classes in pre-primary did three different things… some of them grabbed the mats that I had out for the mat sessions, and they started using the mat for themselves… if one child decided to be innovative and go out and grab something, then the other kids would sort of jump on that.

A noticeable absence in the interviews with the children and their parent was the child's understanding of creativity. Frequently, children would consider being creative as a positive trait and something complimentary. However, they were unable to clearly articulate what creativity meant. Where they did have an idea about what it might mean, they often referred to constructing something.

Hulk: Building stuff.
Ella: Creation. Everyone uses sticky tape. Sometimes they use sticky tape for nothing they want to stick on. [asked about using Beebots] You can make them a maze.
Luke: You can create music like sometimes I create my own chords. I create my own chords, difficult ones to try and see if my dad can do them.
Luna: That they do good [Lego] creation. That look right.

Discussion

Attitudes to technology

Overall, educators and parents were broadly positive in their attitudes towards digital technologies in early learning settings. They were aware that children live in an increasingly digitised world, and their future careers and lives would have an emphasis on technologies. As such, they believed it was important these technologies be integrated into children's learning from an early age. The educators participating in the research stated none of the families of children in their groups had expressed strong concerns about technology use; where issues had been raised, they related to content rather than use of the technology. One educator recounted a family leaving the school due to disagreement with its technology-policies and practices but stated this was an exceptional occurrence. However, two of the parents in the study made clear they did not believe young children should use technologies in learning environments as much as they do.

Although parents and educators expressed concerns of cyber-safety, privacy and digital literacy, their otherwise positive attitudes align with research by Matsumoto et al. (2015) who suggested educators and parents have ambivalent attitudes towards technologies in early learning: they recognised value of technologies in early learning but also have some persistent concerns. As children's technology use is predominantly mediated by their parents (Wilson et al., 2024), this broadly positive attitude is an important factor in the accessibility of digital technologies in early learning. Some parents expressed delight in their children's abilities to code, learn new languages using games, and to develop their musical talents using technologies. Beyond just 'keeping up' with the 21st century push towards technology, parents and educators saw opportunities for self-expression, skills development, and multi-modal learning. Most were accepting of, if not enthusiastic about using digital technologies in early learning. This enthusiasm presents an opportunity for harnessing the potential of digital technologies in young children's creativity development by highlighting their value in this area to educators and parents.

Some held concerns about use of technology in early childhood, particularly regarding the displacement of other activities and the impact on children physically and behaviourally. The anecdotal concerns raised by one educator about the impact of small screen technologies on children's eyesight corresponds to research suggesting there may be a connection between increased screen time and poorer eyesight (Alah et al., 2025). However, the research has not yet determined a direct correlation between screen time and vision problems as it is difficult to account for all possible influences. Further research is needed – both in understanding the extent of the issue as well as in developing technologies that minimise the problem – to ensure parents and educators can provide children with beneficial technologies without unnecessary harm to their eyesight. Additionally, ensuring guidelines disseminated by government and other authoritative bodies are informed by up-to-date research is crucial in ensuring parents and educators are able to make informed decisions about the way technologies are integrated in early learning.

The concerns of two parents about behavioural changes, including sleep problems exhibited by children after using digital technologies have also been considered in the research. Lund et al.'s (2021) systematic review found an apparent association between the use of electronic devices and children's shorter sleep duration. Such results suggest caution is warranted when considering technology use in early learning. However, digital technologies need not be screen-based; 'unplugged' technologies, such as tangible coding devices including *Beebots* may be of interest and benefit in early learning. Hall and Mulder (2023) suggested the affordances of these, including large buttons, bright colours and anthropomorphic designs may be particularly beneficial for young children. Furthermore, Flint and Adams' (2023) study demonstrated that children often move between digital and analogue interactions, incorporating their understandings of both into their natural play. In understanding the concerns parents and educators have about digital technologies, particularly those that are screen-based, the potential benefits of offline or unplugged devices for creativity development present significant opportunities for early years environments.

Concerns about technologies displacing or distracting from other activities were also raised. Parents expressed apprehension that skills or activities they believed inherently valuable were being displaced by technologies. Being able to handwrite their name and playing outside were offered by parents as being at risk of relegation in favour of technology use. Dardanou et al.'s (2020) participants recognised similar possibilities of young children's technology use. They suggested nostalgia and idealised conceptions of a 'good childhood' may be influencing the way digital technologies are viewed. It is notable that each of the educators participating in this study recognised the need for offline and unplugged experiences. They commented on there being a 'time and place' for technology use and being mindful to ensure children were presented with frequent offline learning and play opportunities.

Recognising creativity

Parents and educators gave a variety of answers when asked to define creativity. Some referred to it as 'a mindset' or 'seeing things differently', and others as being able to innovate and express themselves in different ways. Although activities such as drama, music and arts and crafts were raised as examples of creativity, none of the adult participants' definitions were limited to seeing creativity as purely an arts-based pursuit, challenging Runco's (2014) ideas of the 'art bias'. As discussed by Fielding et al. (2023), this wide view of creativity is important in ensuring children are provided with a range of opportunities to demonstrate and develop their creativity.

When asked to identify aspects of creativity demonstrated by children using technologies in the observation sessions, answers were relatively limited. Problem solving and engaging in 'trial and error' were readily recognised as creative behaviours. Children making their own choices about how to express themselves or engage in activities were also mentioned by several of the participants. In commenting on Ella's use of blocks to create a *Beebot* maze, Betty explained the activity Ella had participated in had also been conducted with

two other classes. She observed that across the three classes, children engaged in the activity in many ways and created their own goals using many different resources alongside the robots. By creating an environment where various resources were available, and a culture where 'having a go' was encouraged, Betty's students were able to use the technologies in creative ways. As highlighted by Murcia et al.'s (2020) *A-E of Creativity* framework, creativity development is facilitated by the 'place' and educators and parents have an important role to play in its cultivation.

In recognising problem solving and choice-making as creative behaviours, educators and parents showed implicit understanding that creativity occurs in the process and not just the product. However, it was observed that whilst participants were able to recognise and describe different creative behaviours in a general sense, they often did not readily identify them in the video excerpts presented to them. In two interviews, when asked whether they observed any creative behaviours in the excerpt viewed, the educator answered they did not. Other creative behaviours were noted without explicit connection to creativity. For example, Jana observed Luke was taking the lead and working with his partner to resolve issues with their iPad, thus engaging with peers to achieve a goal. However, this wasn't directly identified as a form of creativity. Other creative behaviours went unremarked upon. For example, Rainbow drew on previous understanding of *Cubetto's* 'token' coding system to create a personal goal to insert a repeating pattern into the code and to effectively write the algorithm on paper. A noteworthy omission in educator and parents' definitions of creativity and observations during the digital excerpts was persistence. None of the participants mentioned determination, resilience, or 'sticking with a task' as creative behaviours, either broadly or regarding the video excerpts.

Children in the study were also asked what they thought creativity meant. Most struggled to articulate a definition, although if asked they agreed it would be complimentary if someone described them as creative. This suggests young children may lack a clear framework within which to understand creativity, or a shared language to describe it. This is an important finding of this study. Without these, it may be more difficult to assist children in developing their creativity, particularly when engaging in digital play and learning.

Recommendations

Understanding how children conceptualise creativity has implications for programming, resourcing and professional development (Stricker & Sobel, 2020). However, this focuses on the educator and parent as driving creativity development. Ensuring children's perspectives become part of a shared understanding is important in foregrounding the inquisitiveness and curiosity inherent to creativity (Lucas, 2025). In this study, semi-structured interviews were used. This was found to be an effective way for adults and some children to communicate their perspectives. However, in some instances this method was limiting in drawing perspectives from children. At all times, the agency of children was foregrounded in relation to their ongoing, informed and self-determined

consent to participate in or withdraw from the study. However, other participatory methods such as drawing or story-telling may be useful in future research.

A key finding of this study was that the participating children did not demonstrate a clear concept of creativity, or what it meant to be creative. This suggests a lack of shared language or framework to describe creativity. Developing a child-focused version of Murcia et al.'s (2020) *A-E of Creativity* framework using age-appropriate and accessible language and imagery could help young children recognise their own creativity as well as providing educators with a supportive tool. Such a tool may assist in bridging gaps in communication between children and their parents and educators. Language – verbal, written and visual – is important as it shapes our thinking. What we can recognise and describe, we can emulate.

It was noted that persistence was an area of creativity under-recognised by the participating adults. Lucas (2016) suggested challenge and complexity are inherent components of creativity; persistence and resilience are ways in which children engage with this. Yet, persistence was a frequently overlooked facet of creativity. This suggests a limitation in the lens through which adults may be viewing children's creativity. Given the ambivalence with which digital technology use in early childhood is often viewed, it is possible persistence may be misread as a problematic behaviour akin to addiction. This may be a factor preventing educators and parents recognising persistence as a creative behaviour. A fear of 'overuse' could also lead to a lack of time being provided for meaningful engagement with digital technologies, limiting opportunities for persistence and resilience to develop. As noted by Leggett (2017) and Fielding et al. (2023), a shift in terminology from 'creativity' to 'creative thinking' may help broaden conceptions of creativity and lead to better recognition and development of it, particularly as it relates to digital technology use.

Limitations and future opportunities

In this study, five children and their parents, and five educators participated in semi-structured interviews. Although the relatively small number of participants necessitated by the case study design may be a limiting feature, it also provided opportunity for deep understanding of the issue. While this may make it difficult to generalise the findings beyond these cases, the focus on a small number of children, parents and educators allowed for depth and nuance. Future research with a larger pool of participants drawn from additional contexts would allow additional breadth to the findings.

It is acknowledged that participants in this study were drawn from a relatively privileged socio-economic context. Three of the five children attended a school or early learning centre in a location with an IRSD of Quintile 5 (least disadvantaged). This may be a factor influencing adult participants' capacity to value creativity over academic skills. Furthermore, each of the children had access to technologies in the educational setting as well as in the home. This may have provided them with a level of baseline ability to use technologies in ways conducive to creativity development and demonstration. Future

research may draw on participants from other areas to consider whether socio-economic advantage influences recognition of young children's creativity.

Conclusion

Even though digital technologies are an important part of young children's learning and have been demonstrated to be useful tools in creativity development, concerns persist about their place in early learning. Parents and educators are concerned about the impact of technology use on young children's physical and social development. They are concerned about a lack of attention to other experiences and skills that using technologies may replace. Issues of online and digital safety also remain, particularly regarding privacy and exposure to inappropriate content. However, despite these concerns the participating educators and parents were generally enthusiastic and optimistic about using digital technologies in early learning. Their potential for facilitating diverse learning and expressive opportunities were noted. The participants also understood the necessity for children to be prepared for a future that will be technology-driven. It is possible this ambivalence in attitudes towards the use of digital technologies in early childhood may be limiting our ability to harness their potential with regard to developing children's creativity. Although valid concerns must be acknowledged and mitigated, we must be cautious not to unnecessarily deprive ourselves of the positive possibilities presented by technologies.

The excerpts from observations viewed by the participants in this study demonstrated various examples of creativity while using digital technologies. They displayed persistence, agency, curiosity, a willingness to experiment, and often a sustained focus on complex tasks. However, many were only able to identify creativity in relatively narrow ways when viewing the video excerpts. They readily acknowledged trial and error and problem-solving, and some also acknowledged choice-making. Other creative behaviours, particularly persistence, were overlooked. This may suggest a lack of shared understanding of how creativity may be demonstrated when young children use digital technologies. As such, this study highlights a potential gap in shared understanding between young children, their parents and educators, and researchers regarding how creativity in digital play and learning is conceptualised. Whilst there appears to be a shared understanding of the importance of creativity, it is not always consistently recognised. This may suggest our recognition of creativity continues to largely align with a 'Big C/little c' binary. This disconnect between the creativity young children demonstrate and educator and parents' ability to recognise it may limit the extent to which creativity may be developed. Therefore, the development of tools highlighting 'mini c' creativity and resources using child-friendly language to describe creative behaviours, as well as wider dissemination of resources to support parents and educators developing their understanding of creativity in digital contexts could assist in the opportunities offered by digital technologies being made more impactful in the development of young children's creativity.

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Acknowledgement

This research was supported by an Australian Government Research Training Program (RTP) Scholarship.

Ms Katie Fielding *BA, GradDipEd, MEd* (corresponding author) is a researcher with the Australian Research Council Centre of Excellence for the Digital Child, Curtin University, Western Australia [https://www.digitalchild.org.au]. Her research is focused on the use of digital technologies by and with young children, particularly in creativity development.
ORCID: https://orcid.org/0000-0002-6427-7856
Email: katie.fielding@curtin.edu.au

Professor Karen Murcia *BAppSc, MEd, PhD* is Professor in the School of Education, Curtin University, Western Australia. She is a Chief Investigator with the ARC Centre of Excellence for the Digital Child [https://www.digitalchild.org.au]. Her research interests include scientific literacy for citizenship, STEM Education, children's creativity and digital learning futures.
ORCID: https://orcid.org/0000-0002-1900-2781
Email: karen.murcia@curtin.edu.au

Please cite as: Fielding, K. & Murcia, K. (2026). 'Freedom to experiment': Educators and parents reflecting on children's creativity with technologies. *Issues in Educational Research*, 36(3), 951-969. http://www.iier.org.au/iier36/fielding.pdf