Imaginative play in digital environments: designing social and creative opportunities for identity formation

Sonia Livingstone & Kruakae Pothong

Published online: 17 Mar 2022.

Submit your article to this journal ⃗

View related articles ⃗

View Crossmark data ⃗

Routledge
Taylor & Francis Group

🔓 OPEN ACCESS   Check for updates

Imaginative play in digital environments: designing social and creative opportunities for identity formation

Sonia Livingstone 🆔 and Kruakae Pothong 🆔

Department of Media and Communications, London School of Economics and Political Science, London, UK

ABSTRACT

Digital technologies afford ample opportunities for children's development, identity formation, imagination and sociability through free play. At stake, we argue, is children's agency. Yet free play is under threat in both digital and nondigital contexts. Recognising that different configurations of the contexts in which play occurs affect whether and how children can play on their own terms, this article draws on the long tradition of research on child-led or free play in natural or nondigital contexts to explore children's play in digital contexts. Combining qualitative and quantitative research methods, we examine the qualities of children's play and the factors that shape it so as to reimagine, together with children, parents and professionals working with children, a digital environment that could better serve children's best interests. The findings show that the qualities of children's play are strikingly similar in digital and nondigital contexts but that children find certain social-technical configurations restrictive of their agency and freedom to develop their identity through play in digital contexts. Based on children's implicit and explicit calls for change, we propose a 'playful by design' approach by which designers and providers of digital products and services could urge those with the powers to redesign digital environments to prioritise digital features that promote children's imaginative, social, open-ended, risk-taking and stimulating play while limiting the risks to children's safety, privacy and self-determination that arise from commercial interests.

Introduction

Play is widely valued for the joy it gives, and as a means for children to express themselves, build relationships with others and make sense of the world around them on their own terms. The right to play is included in the UN Convention on the Rights of the Child and defined as 'any behaviour, activity or process initiated, controlled and structured by children themselves' (United Nations Committee on the Rights of the Child, 2013). As British children's author and play advocate Michael Rosen (2019)

explains, play offers 'opportunities to invent, improvise, adapt, be creative with the world around you and with the world inside your own head.' This article explores how these opportunities manifest in digital environments, and how a value-sensitive design approach can propose improvements (Costanza-Chock, 2020; Friedman & Hendry, 2019), given that children spend much of their lives engaged with digitally-mediated contents and forms, connections and cultures.

The importance of play has been articulated by influential thinkers throughout history for how it enables children's social, emotional, physical and cognitive development (Cowan, 2020). Their ideas have inspired child-centred interventions in education, urban planning, family policy, toy design and more, to enhance opportunities for children's identity, participation and fullest development. Play theorists and advocates particularly prioritise child-led or free play as vitally linked to children's agency as co-constructors of their own lives and of the society in which they participate (Brussoni et al., 2012; Huizinga, 1938; Sutton-Smith, 1999). They argue that, however valuable adult-guided play is for learning or other benefits, children need sufficient opportunities for play that is relatively free from adults' expectations, judgements, restrictions or rules. Hence, they push back conceptually and politically against efforts to harness play to adult-framed instrumental objectives, and they champion children's voices, participatory methods and child-centred designs (Gill, 2021; Russell, 2013; Thivant, 2018).

Most research, policy and advocacy regarding children's play focuses on the physical environment (natural and built) and pays little attention to the growing importance of digital media in children's lives (Ofcom, 2020). Some even express a general antipathy towards digital technologies as the enemy of healthy bodies and healthy minds and, thus, of free play. We do not disagree that the use of digital technologies is associated with a range of content, contact, conduct and contract risks as well as risks to children's privacy, health and wellbeing (Livingstone & Stoilova, 2021). Nor do we disagree that children's outside play is under threat, whether because of increased pressure on educational outcomes, reduced public safety, increased parental and other surveillance, or the erosion of planned or public or informal play spaces (Dinsmore & Pugh, 2021; Gill, 2021; Mullan, 2019). For example, the British Children's Play Survey (Dodd et al., 2021) found that children have less time for independent play than their parents had enjoyed, and Baines and Blatchford (2019) found that break times in English schools had been cut since 1995 by up to an hour per week, reportedly so that teachers can cover the curriculum and manage poor student behaviour.

However, simple binaries make for unsatisfactory theory, and we question the popular assertion of an offline/online boundary and its mapping onto real/virtual or good/bad. The very effort of listening to children's voices and experiences championed by child rights and play advocates demands recognition of children's pleasure and sense of agency not only in nondigital contexts but also in digital ones (Mukherjee & Livingstone, 2020; Third & Moody, 2021). This matters since children's lives are becoming systematically reliant on the digital environment, because of the ubiquity of mobile technologies, public and private sector transformations in intelligent (AI-driven), datafied, surveillant and other kinds of 'smart' environments, and because childhood cultures are creative, dynamic and interconnected across contexts (Grimes, 2021; Kucirkova, 2021).

While it is a missed opportunity that advocates of free play neglect or underestimate or misunderstand the complexity of the digital environment and its importance to children,

it is of greater concern that young internet users are typically conceived by businesses either as a profitable market, resulting in practices of datafication, algorithmic maximisation of attention and persuasive design, or as an interloper in spaces designed for adults, resulting in the failure adequately to respect children's rights or regulate to address their needs and evolving capacity (5Rights Foundation, 2021; Lenhart & Owens, 2021; Radesky et al., 2020). The combination of aggressive business strategies and ineffectual regulation has sustained an anxious, risk-averse and restrictive approach towards children's digital activities on the part of the public, including parents, with needed interventions to protect children's safety and privacy tending inadvertently to overrule children's freedom to play and, thereby, to learn and grow through exploring, experimenting and making mistakes (Livingstone & Blum-Ross, 2020).

This article asks a descriptive and a normative question. We ask, descriptively: how does free play manifest in the digital environment? We prioritise children's own accounts of their play, informed by a public consultation and a national survey of children, to understand whether and how they distinguish between or integrate ideas of play across digital and nondigital contexts. We also draw on two narrative literature reviews – on the multidisciplinary history of free play (Cowan, 2020) and on children's play in digital contexts (Colvert, 2021).

Cowan (2020) examined the rich debates over why play matters, encompassing ideas of play as necessary for child development, as a spontaneous mode of self-directed learning, as an effective means of teaching and guidance, as therapeutic, and as a contribution to and enactment of wellbeing as well as a child's right. The importance of play for children's agency and fullest development is central to each of these, but commonly each is harnessed to meet objectives formulated by adult society. Whether these have children's interests at heart or instead prioritise commercial or political or other interests, they tend to intrude into and instrumentalise children's free play. Adults may not even regret its loss, given that play 'may be rude, messy and noisy, and may challenge expectations or conventions' (Cowan, 2020, p. 11).

In many ways, research on digital games and gaming cultures offers a valuable account of children's play in a digital world. However, we were cautious in relying on this insofar as it tends to narrow the scope of play by limiting play to gaming and, by taking its lead from adult game play, tending to divorce digital play from the wider contexts of children's lives. Hence Colvert's review (2021) examined children's digital play broadly and holistically. She found that play in any context is influenced by three crucial factors: people (whether parents, strangers, teachers, other players, also policy makers, marketers, service providers); products (such as toys, objects, apps, cultural artefacts and also platforms and networked infrastructures in the digital environment); and places (where the play occurs, including physical and virtual spaces, at home, school, the mall, in Minecraft, on Zoom).

In making the case for free play, Cowan's review (2020) concluded by identifying the prototypical qualities of free play worth promoting in children's everyday lives. Colvert's review concluded by showing how the complex interactions among the factors of people, products and places enable or constrain these qualities of free play in digital contexts. Our normative question inquires into the configurations of people, products and places that enable the qualities of free play to thrive in a digital world in order to generate recommendations to the providers of digital products and services, including designers and

policymakers. This question highlights the holistic concept of 'best interests' that balances risks and opportunities, as well as children's agency and adult responsibility, within a child rights framework (Livingstone & Third, 2017), while being practical in its concern to improve the design and provision of playful opportunities in and beyond digital contexts.

Methods

The primary method was an online UK-based public consultation about free play in and across digital and nondigital environments. A total of 126 participants joined our consultation between winter 2020 and spring 2021, of whom 63 were children and young people aged 3–18, 33 were parents or carers and 30 were professionals who work with children (such as teachers, youth workers and early years' educators). Findings from the public consultation informed the questionnaire administered in a UK-wide survey with children aged 6–17 years old (Livingstone & Pothong, 2021). Both qualitative and quantitative approaches followed the logic of beginning with questions about play in general before focusing on play in digital contexts.

The consultation combined design-led approach and deliberative methods (Steiner, 2012) to achieve what Kinnula et al. (2017) described as the critical form of empowerment by supporting participants, particularly children, to critique their playful opportunities, identify the limits set by existing digital assemblages and articulate how the qualities of their play can be improved. The combination of a design-led approach and deliberation has the potential to engage the public with complex technology design and relevant policies (Pschetz et al., 2019). Thus, our approach extended the benefits of the co-design (Sanoubari et al., 2021; Third & Moody, 2021) and participatory (Schepers et al., 2021) methods that emphasise the democratic value of participation in decision-making and seek levelled power relations in decision-making processes.

Learning from research on meaningful engagement with children online (Cortesi et al., 2021) and offline (Coleman et al., 2018; Third & Moody, 2021), we limited each group discussion to 45 min and devised conversation prompts to appeal to children's playfulness and engage adults' past or present experiences of play. We used cultural probes, a design-led technique, to elicit insights from participants to inspire innovation (Wyeth & Diercke, 2006), and prioritised the open-ended and reflective qualities of deliberation to encourage participants to work through their play experiences in both physical and digital contexts, and to articulate their demands for improvement. The cultural probes took the form of illustrations representing the qualities of free play (Cowan, 2020). These helped participants relate their everyday experiences to the abstract concept of free play and to reflect on how these vary across contexts. We then invited participants to build on their contributions to suggest how their (and children's) experiences could be improved. This in turn revealed what our participants found problematic about play with digital technologies, including their understanding of the wider commercial ecology.

Conducting research during a pandemic was challenging. While we advertised the consultation in public, using a range of social media, we primarily recruited participants through trusted intermediaries, including public and commercial organisations advocating play, youth groups and parent groups. We developed two email consent templates for participants under and over 18, detailing the research activities, objectives and our

commitment to confidentiality, anonymity and participants' rights to withdraw without consequences, and asking them to consent by typing *X* next to each condition of their participation. We allowed some participants to audio record their consent at the start of the session – in the case of adults, children accompanied by a parent or carer, and some teenagers whose parents had already provided consent for their participation.

Online discussion groups were constructed flexibly, with some combinations of young people and the professionals working with them, family groups with one or two parents and their children, or a mix of parents and professionals. To ensure a lively discussion in which everyone had a chance to express their views, we ensured a maximum of six participants per moderator. We used Zoom to host the discussion groups, mitigating its safety and security risks (Aiken, 2020) by only providing a fresh Zoom link and password to join our consultation via email after participants confirmed their attendance. For safety reasons, we did not use Zoom's breakout rooms unless we, having passed the enhanced UK Disclosure and Barring Service (DBS) check, could each moderate a breakout room. We deleted the video, retaining only the audio recording from Zoom to ensure participants' anonymity. This was transcribed and anonymised before entering into NVivo 12 for thematic analysis.

We recruited our online survey respondents through a reputable company which maintains a panel of 340,000 UK citizens; 1033 children aged 6–17 years old participated. They were sampled to be representative of the UK population, with quotas set for age and gender. Questionnaire completion took between 10 min (shorter version for 6- to 9-year-olds) and 15 min (full version for 10- to 17-year-olds). As panel members, parents were offered a small cash reward for their participation. Compared with the national population, the survey sample was slightly more middle class and slightly more from Black and ethnic minority groups.

Play in the eyes of children

Each group discussion began with an ice-breaking activity which invited accounts of participants' recent playful experiences. This generated diverse answers: a six-year-old boy who enjoyed playing 'freeze tag' with friends in school, a 17-year-old girl recalling playing basketball and penny board, a 16-year-old girl who liked 'going on TikTok.' A primary school teacher told us: 'I just tried to knock my chocolate out of her hand before she could eat it. That was the game we were playing.' And a mother of two children expressed her joy in playing a roleplaying video game called 'Horizon'. Participants enjoyed talking about play, echoing, elaborating on and extending the qualities of play identified by Cowan's literature review, as we examine in the next section. It is noteworthy that children did not refer to activities that served an instrumental purpose but, rather, emphasised the value of 'play' for its own sake (as do play theorists: Goodley and Runswick-Cole (2010); Lester and Russell (2008); Rogers and Lapping (2012)).

As we analysed responses to the cultural probes illustrating the various qualities of free play, we saw in practice the truth of Colvert's conclusion that, 'although all of the qualities of free play can be experienced by children across physical and virtual spaces, the qualities merge and intersect with the digital environment in complex ways' (2021, p. 51). Not only did children talk about play in similar terms across contexts, to the point where it was sometimes hard to be sure whether they were discussing digital or

nondigital contexts, but they also drew thought-provoking parallels across contexts. For instance, they talked with delight about long-familiar forms of play such as pretending to be a superhero, playing hide-and-seek or simply playing with a cardboard box, and then they pointed out how these kinds of play could be enjoyed in the digital environment.

> Back when we used to play like those dress-up games, it was us wanting to be someone else … And now, online, we seek that but through other people's lives. We watch YouTubers and follow people on Instagram who have these lives that maybe we look and idolise. (Girl, 17 years old)

> You can play hide and seek on Roblox and I do it regularly. I actually feel the same level of, oh my God, they've just run past me. (Girl, 18 years old)

> I can see the comparison [of …] the box with Minecraft, that's very much a mix. I said it was a sandbox, it opens your imagination. You can build whatever you want. If you wanted to build a ten-foot replica of an orange, you could do. (Boy, 17 years old)

For children, play spans and connects physical and digital environments. Interestingly, although our teenage participants tended to see themselves as too old to play offline, they identified with digital play, including activities that might seem to them childish if sustained offline. It seems that the pleasures of hide and seek or let's pretend continue in new forms, still meeting the need to have fun, experiment, construct identities and exercise agency, albeit in ways that fit peer norms and available resources (Bird & Edwards, 2015; Marsh et al., 2016).

To construct the survey questionnaire, we turned children's accounts of the qualities of free play into short statements, also drawing on Cowan (2020). This resulted in 12 qualities of free play valuable for and valued by children:

1. Intrinsically motivated: I play like that because I want to.
2. Voluntary: I can start and stop playing when I want to.
3. Open-ended: When I play like that, I have the power to make up what will happen next.
4. Imaginative: I use my imagination when I play like that.
5. Stimulating: Playing like that can be an exciting or challenging experience.
6. Emotionally resonant: I have a lot of different feelings when playing like that.
7. Social: I like talking with other people about playing like that.
8. Diverse: People can be playful in different ways that are important to them.
9. Risk taking: When playing, I can be naughty or break some rules without being told off.
10. Safety: I feel safe when I play like that.
11. Sense of achievement: After playing like that I feel really happy that I've achieved something.
12. Immersive: When playing like that, I feel like I'm in a different world.

Respondents were asked to apply these statements to digital and nondigital contexts using a four-point scale (where 1 = disagree a lot and 4 = agree a lot). For nondigital contexts, we invited them to recall when 'you recently had a good time playing or being playful in real life, without a digital device'. For digital contexts, we first asked children which popular apps they play, and then asked them to rate the qualities of play for two of these,
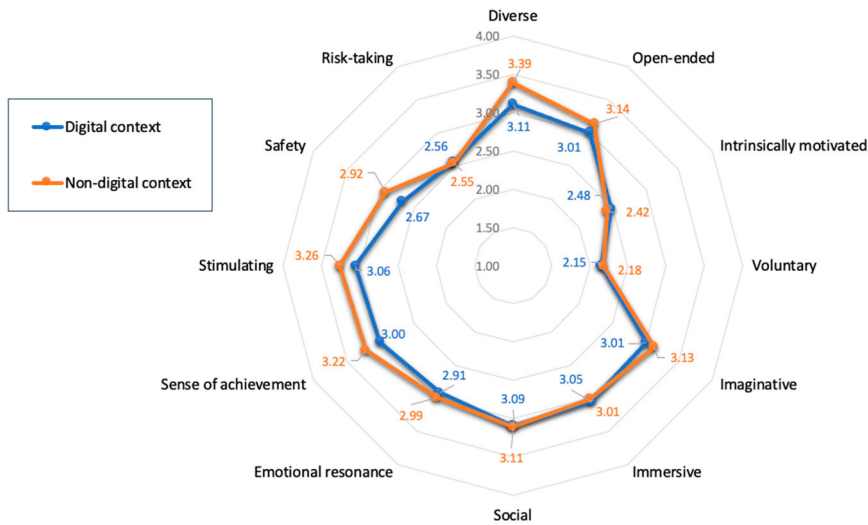
Figure 1. Children's perceptions of the qualities of play in digital and non-digital contexts.

resulting in answers for eight apps in all. These were averaged across respondents and compared with the answers for nondigital play, as shown in Figure 1.

Statistical tests of the differences shown in Figure 1 indicate that children find play in nondigital contexts to be more diverse, stimulating, imaginative, open-ended, safe and offering a greater sense of achievement than play in digital contexts. Nonetheless, it is striking overall how similar children perceive their play to be across contexts commonly regarded by adults as highly dissimilar. It can be concluded from the qualitative and quantitative research that children seek and enjoy similar experiences whatever the context. In other words, both similarities and differences are interesting, revealing that children do not make a hard-and-fast contrast between online and offline. Also noteworthy from the findings in Figure 1 is that children were more critical of both digital and non-digital contexts for the opportunities afforded them for intrinsically-motivating, voluntary, risk-taking and safe play. We gained an insight into why this is through children's discussions, where they revealed their sensitivity to the factors relating to people, products and places that differentiate their opportunities and their experiences across and within digital and nondigital contexts. We found these factors also salient to parents and professionals, though for them the online/offline boundary persists as a particularly symbolic binary. We should note that conducting the research during the Covid-19 pandemic is likely to have intensified both the importance of digital technologies in children's lives, and its salience to all, and we found participants keen to tell us how they have sought new opportunities for play online that they might not have engaged in previously.

> I was annotating, and my cousin wanted to know how you do that … So, my aunty put a whiteboard on the Zoom for us to annotate on. (Girl, 9 years old, on playing family Scattergories on Zoom)

> My eight-year-old was playing on Zoom … all the kids, they all have access to the screen, and they're sort of playing hide and seek or catch, tag, so someone has to draw, and someone has to be the eraser. (A mother and creative professional)

> Over lockdown, I've been baking a lot … sometimes with my sister … over a call. We'll try and bake the same thing … like New York-style cookies, and that was really fun and it was a way we could connect … We were just using … WhatsApp. (Girl 14 years old)

These and other observations reveal not only families' enterprising determination to play and socialise despite unprecedented circumstances, but also some of the design features of digital contexts that facilitated their engagement – the Zoom whiteboard, the convenience of visual chat using WhatsApp. The factors that enable children's free play to thrive in a digital world are diverse, encompassing parental mediation strategies, peer norms, children's interests and preferences, business practices and design. To avoid making recommendations that end up burdening individuals with the task of improving experiences that are, after all, heavily shaped by major businesses, we instead examine possibilities for systemic change. Technological design embeds human values and human rights in ways that enable and inhibit activities and shape outcomes that promote or undermine well-being. To ensure beneficial outcomes, designers need to understand the contexts of use and how people – here, children – engage with them and why.

How the qualities of free play manifest in digital contexts

To move from a description of free play in a digital world to a normative call for improvement, we again take our lead from the public consultation. Specifically, we explore how participants discussed the qualities of free play by focusing on digital contexts, noting possible explanations for the survey findings regarding both similarities and differences across contexts, and listening carefully for indications of design features that could become practical levers for improvements.

Beginning with the importance of the social quality of play, children and young people talked about how they play videogames to generate a sense of 'togetherness' that, for some, became their lifeline during the lockdown.

> I feel like I've always got opportunities to talk to people with video games. That's the main point of online, playing with friends while talking to them. (Boy, 17 years old)

> Because you all play together, you all have to talk to each other and interact. Especially in lockdown that's been a big thing, that you can talk and play at the same time. (Girl, 16 years old)

Adults also recognised the significance of digital technologies in supporting children's social development and connection.

> I've sent [my nieces and nephews] Harry Potter Trivial Pursuit … we play the same board game, but we moved each other's pieces while we interacted on the screen, so we're still able to replicate what we would do in real life. (Anti-bullying training manager)

> The most successful computer games that young people are into are ones where they can communicate live with their friends and have a group task [and] … the feedback of a shared experience in the digital realm. (A theatre maker working with vulnerable children)

While in person restrictions during the pandemic rendered the digital environment more than ever necessary for children's social play, accessible communication channels and opportunities for peer-based and intergenerational play are likely to remain valuable whatever the circumstances.

When it comes to imaginative play in the digital environment, this typically manifests in world-building and sandboxing games, as enabled by flexible and open-ended designs.

> Minecraft … gives you the opportunity to do things that you wouldn't be able to do in real life. Obviously, flying's one of them, using potions, that kind of thing, and exploring environments that you wouldn't necessarily have easy access to in real life. (Girl, 18 years old)

> [In The Sims] you can also play with the avatars and you can build houses for them … you can do anything you like. (Girl, 13 years old)

Imaginative play can result in a creative expression of identity that transcends offline/online boundaries.

> On the weekend, me and my mum made this parody music video about our Christmas jumpers … My mum wants to post it on YouTube. (Girl, 13 years old)

> I like to learn all my new dances and film them … I was teaching my Nana a TikTok dance. (Girl, 12 years old)

Imaginative digital activities can be highly immersive, which children appreciate as a valuable quality of play.

> [In] Red Dead Redemption … there are so many little things that just made the game … interesting and fun, and it just makes the game more immersive. (Boy, 13 years old)

When children talked about stimulating play in the consultation, their examples often involved competition or the heightened emotion of meeting a challenge. In part, this is designed into the interactivity, narrative and other mechanics of the game.

> There's a game we play called Manhunt … it's multiple people. One's the seeker [and …] you have to run away and they have to hunt you down. [It's fun] because of the excitement and you can see how they can do it and how you do it. (Boy, 10 years old)

> You might be playing a first-person shooter … then your friends would hide around the map and then you'd try and find them and kill them … it's just the anticipation of finding them in some stupid spot or just scaring them when you do find them. (Boy, 16 years old)

Some digital technologies, such as Augmented Reality (Sobel et al., 2017) and motion-sensing technology in video games (Hara & Ovaska, 2014), afford children stimulation by enabling them to play across physical and digital spaces, extending their interaction with digital technologies and other players beyond the screen.

> I have a game on my Nintendo Switch … it's a sports game … [My younger sister] does it too, and you have a ring and you have a little thing that you attach to your leg and you put a controller in each. You can do different activities to defeat the monsters. (Girl, 12 years old)

> Thanos versus Captain America … [that] I've made [from cardboard boxes] … I get ideas from Avengers Infinity War. (Boy, 10 years old)

This kind of hybrid, stimulating play can include players of diverse ages and gives children a sense of achievement (Stephenson, 2003). Drawing on their intrinsic motivation and desire for risk-taking, children voluntarily push boundaries, whether internal

(e.g., personal capabilities or limits) or external (e.g., rules and restrictions or challenges set by others or the nature or design of the environment itself) as a way to develop identity and explore their world.

> I like to outsmart my enemies, because every time I know what action they do before they do a type of move, so I outsmart them. I know that action means he's going to do that move, so that way I know which action I have to do to make sure he doesn't attack me. (Boy, 7 years old)

Despite the pleasure that children reported from risk-taking in play, our survey shows that children have not found so many opportunities for risky fun as they might like in either the physical or digital environment. This may be because in the tension between children's desire to push boundaries and adults' safety agenda (Coster & Gleeve, 2008; Gill, 2007), the latter generally wins, keeping them safe yet simultaneously constraining children's agency and opportunities to express and develop their identity and skills (Brussoni et al., 2012). That said, children's appetite for risky play does not mean they always prioritise risk-taking over safety. In our consultation, children described a safe environment as the basic requirement for them to enjoy free play. In short, they appreciate rules that keep them safe while allowing them to explore the world and have fun.

> Some rules, sometimes they're good … Safety regulations and stuff. But then there are other rules that you feel like are stopping yourself from having fun. (Girl, 16)
>
> Animal Crossing is pretty good … it is aimed at young children, mostly, but it's played by a lot of adults, as well … All in all, it's a safe game for children and there's a lot of moderation in place to make sure that people aren't hurting each other. (Girl, 18)

Some recognised the complexities involved in calling for safety that is not restrictive of agency.

> Ideally, you'd probably want more censorship online. But then again, I know people would be complaining that you're taking away freedom of speech … You don't want to censor everything, but you don't want all of this horrible hateful stuff on the internet. (Girl, 16)

Children also told us in the consultation how they enjoyed open-ended and diverse play. They considered play open-ended when they were in command, able to improvise for fun, including with physical or digital 'loose parts' (Play England, 2012).

> In [Minecraft], you can basically do whatever you want because you just download the mods for who knows what you'd like … You can build whatever you want … because it's a sandbox game, so you're not really following a script. (Boy, 16 years old)

In line with the potential of digital (Marsh et al., 2018; Valk et al., 2013) and non-digital materials (Play England, 2012) to facilitate open-ended play, children in our consultation showed great appreciation for adaptable materials and digital features that enable them to direct their own play. This results in a diversity of experience that they also appreciate, in turn enabled by the sheer variety of digital resources available to them.

> I watched quite a lot of, and make my own, YouTube videos. And I think you watch things from literally all over the world, and they're things you wouldn't get to see otherwise. (Girl, 13 years old)

Last among the qualities of free play discussed here, emotional resonance is discussed by researchers as important for children as they make sense of the world around them

through play, processing their experiences and emotions by playfully acting out scenarios relevant to yet at a distance from their everyday lives (Anable, 2018).

What needs to change and why?

The state of play described by children highlights their agency and adaptability in the way they appropriate digital resources for social, imaginative, risk-taking and stimulating play. Some features already support their free play in a digital world. For example, they enjoy communicative and competitive game mechanics for these features facilitate the qualities of social and stimulating play. However, the survey findings suggest that play in non-digital contexts offers a greater sense of achievement, more diverse, open-ended, stimulating and imaginative play and safety.

> There are limits to what you can do because there's still a code which the games runs. So, if it was a shooter game, you wouldn't exactly be able to do stuff that would be outside the normality of that game without breaking the game. (Boy, 16 years old)

> In certain games, there's like a big creation aspect behind it, and then in some games you've got little to no customisation whatsoever. So, you kind of feel trapped within the game, and I feel that sometimes can ruin a lot of the immersion of the game. (Boy, 13 years old)

Further, children told us that they find the commercial pressures and compulsive features that accompany their digital play intrusive and problematic.

> Boy (6 years old): '[In Beast Quest], there's jewels, you can get one which is free. And other ones, you have to pay … '

> Mother: 'If he wants to get through to the next levels, sometimes he has to pay to buy the jewels. Is that right? Because he's not allowed to buy anything, he's stuck. So, eventually, he gives up, [saying] I don't want to play anymore.'

> One thing I don't like is in Minecraft, you have to pay in game coins to get maps and things and skins. The really annoying thing about that is that you're paying in game money, but … with real life money. So, I wish there was a way that you could earn things in games from just playing them, rather than having to pay. (Girl, 12 years old)

Other than pressure to pay with real money, including via loot boxes (Close et al., 2021), commercial pressures also manifest as freemiums, encouraging children to engage but then requiring payment to share their play socially with others.

> I spend most of my time playing video games … And I play with my friends virtually, that's my thing. There's this engine called Unity, which is what I make my games on. And because of coronavirus, they made it free. So, I just started using it, and I had fun making my own games. But the free version doesn't actually allow you to send it to other people, so I've just been making them and playing them myself really. (Boy, 17 years old)

Other than commercial pressures, insufficient platform interoperability also constrains children's social play.

> On Roblox, there are thousands of different worlds and games to play on. Some of them, you can't play together if someone's on a computer and someone's on an iPad. (Girl, 9 years old)

> I'd want more games to be able to have friends and be able to chat. Because otherwise, sometimes, on Among Us, you can't get friends. (Girl, 9 years old)

Table 1. Qualities of play, and the digital features that enable or inhibit it, from children's perspectives.

Qualities of play	Children's perspectives	Digital features that enable or inhibit play
INTRINSICALLY MOTIVATED & VOLUNTARY	Children make little distinction between intrinsic and voluntary motivations to play. They describe play as self-initiated, intuitive, unstructured and not serving any instrumental purposes.	• Open-ended (flexible) design • Transmedia • In-game micro transactions (loot boxes) • Targeted advertisements • Child influencers (e.g., Vloggers)
OPEN-ENDED	Children see open-ended play as affording ample opportunities to direct their play and improvise resources around them to have fun.	• Open-ended (flexible) design
IMAGINATIVE	Children talk fondly of imaginative world-building, online and offline, which often entail creative outputs (e.g., a LEGO house, a Minecraft Town or a TikTok video clip).	• Open-ended (flexible) design • Hybridity • Transmedia • Variety of creative tools • In-game micro transactions (loot boxes)
STIMULATING	Children find play stimulating when the play keeps them engaged and absorbed in the flow, often because the play is interactive, competitive or a bit challenging.	• Interactive features • Competitive and team-based game mechanics • Augmented reality • Motion-sensing technology • In-game micro transactions (loot boxes)
EMOTIONALLY RESONANT	Children make sense of the world around them through play, testing their ideas, processing their experience and emotions by playfully acting our scenarios.	• Variety of games, contents and creative tools
SOCIAL	Children play to stay connected and to nurture their relationships with others.	• Communication tools • Intergenerational play • Platform interoperability
DIVERSE	Children enjoy infinite possibilities to play in ways that are meaningful to them.	• Open-ended (flexible) design • Variety of games, contents and creative tools
RISK-TAKING	Children enjoy exposing themselves to uncertainties, exploring and pushing their mental, social and physical boundaries, and discovering their evolving capacities.	• Open-ended (flexible) design • Competitive and team-based game mechanics
SENSE OF ACHIEVEMENT	Children enjoy a sense of achievement from puzzle solving, creative outlets or having pushed their mental or physical limits.	• Competitive and team-based game mechanics
IMMERSIVE	Children often feel as if they were in a different world because they are so absorbed and immersed in their play.	• Interactive features • Competitive and team-based game mechanics • Augmented reality
SAFE	Children need to feel safe to fully enjoy the positive qualities of play and feel confident in trying things out and taking risks.	• Responsive platform moderation • Parental control functions • Real-time privacy control function

They also find that play in digital contexts can be hostile or unsafe, exposing them to inappropriate content. The way contents are curated and presented to children can encroach on how children imagine fun to be. Their views on what should be done are often nuanced and insightful.

> I have a sister who's ten and who just got her first phone … people always say that you can have parent controls. Like on YouTube, you can … regulate what your child is seeing, but the internet is so big that you can't regulate everything. (Girl, 17 years old)

> I think there should be a request sent: so and so wants to join your party, do you accept? Instead of just, so and so's joined … On Instagram, if you've got a public account, then if someone goes onto it, they can see what you look like, if you're wearing your uniform … they can see your school. (Girl, 13 years old)

> With YouTube … there's no proper filter … it was a cartoon of a baby throwing up but then in the end it was a witch coming over and taking them and [my child] had bad dreams. (Mother of two young children)

Research shows that much of these contents, including advertisements, are promoted to children by algorithms driven by a business model centred on monetising audiences' attention (Burgess & Green, 2018; Radesky et al., 2020). These algorithms recommend content to children in ways that leave them with limited control over what they see (5Rights Foundation, 2021). In addition, the architecture of video sharing and social media platforms likely contributes to their attention and emotional attachment to the products promoted online (Ladhari et al., 2020).

In our consultation, children called for more of the digital features that promote their social, imaginative, risk-taking and stimulating play and less of the features that undermine their agency and identity formation. They articulated their calls for change both implicitly and explicitly as part and parcel of how they talked about their lives, the barriers they face, what excites them, and what they value. We show the mapping of these digital features onto free play qualities in Table 1.

Based on the frequency of the themes coded in the consultation transcripts, children's top call is for more creative and imaginative play opportunities. The next most popular call from children is for more open-ended and flexible play opportunities. Children's third call is for features that enable hybrid, transmedia and embodied play. Communication is next: they particularly want more diverse range of communication, especially as part of their games to facilitate greater social interaction. Then, they call for safer and fairer digital environment, with specific suggestions for safeguarding measures and alternative business models that they deem more acceptable. Finally, a fairer digital environment, to children in our consultation, meant no or better managed commercial exploitation.

Conclusion: towards 'playful by design'

From their own accounts of play in the digital environment, children highly value open-ended (flexible) environments which afford them opportunities to negotiate the rules and flow of their play or use their imagination to improvise play on their own terms, and in turn make their play experience more diverse and stimulating. They also appreciate digital means for communication, whether as standalone applications or as part of their digital games, because these communication channels keep them connected with their peers and families. When the play is open-ended and not scripted for them, it becomes immersive and emergent through social interaction among players. This emergent nature of free play is intrinsically motivating, diverse, and often emotionally resonant because it arises from the players' different real-life contexts.

Open-ended play can involve risk-taking, and this in turn can generate a sense of achievement and build character.

Children's accounts of their play in our research show that they recognise the different features of the digital and non-digital environment that enable or inhibit each quality of free play. They call for digital features that better support their exercise of agency and identity formation through social and imaginative play. They also noted that for the digital environment to be supportive of their development and compatible with their evolving capacities, it needs to be configured in ways that make them feel safe and that treat them fairly.

As play is fundamental to children's development (Whitebread et al., 2012), we call on the public and on business, especially organisations with the power to redesign the digital environment, to prioritise design features that promote the qualities of free play that children value. This requires both addressing the problems that hinder children's digital opportunities and also proactively nurturing the important qualities of free play. What children told us about their play experience in digital contexts explains why we add to the existing calls for safety by design (eSafety Commissioner (Australian Government), 2019) and privacy by design (Cavoukian, 2011) the further call for playful by design (Livingstone & Pothong, 2021) which we commend to providers of digital play opportunities accessed by children.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

Notes on contributors

Sonia Livingstone DPhil (Oxon), FBA, FBPS, FAcSS, FRSA, OBE is a professor in the Department of Media and Communications at the London School of Economics and Political Science. She is the author of 20 books on children's online opportunities and risks, including 'The Class: Living and Learning in the Digital Age'. Sonia has advised the UK government, European Commission, European Parliament, Council of Europe and other national and international organisations on children's rights, risks and safety in the digital age. [email: s.livingstone@ lse.ac.uk]

Kruakae Pothong, PhD is a visiting research fellow in the Department of Media and Communications at the London School of Economics and Political Science. Her research spans the areas of human–computer interaction, digital ethics, data protection and Internet policies. Kruakae specialises in designing social-technical research, using deliberative methods to elicit human values and expectations of technological advances, such as the Internet of Things (IoT) and distributed ledgers.

ORCID

Sonia Livingstone http://orcid.org/0000-0002-3248-9862
Kruakae Pothong http://orcid.org/0000-0002-1735-7941

References

5Rights Foundation. (2021). *Pathways: How digital design puts children at risk*. https://5rightsfoundation.com/uploads/Pathways-how-digital-design-puts-children-at-risk.pdf

Aiken, A. (2020). Zooming in on privacy concerns: Video app Zoom is surging in popularity. In our rush to stay connected, we need to make security checks and not reveal more than we think. *Index on Censorship*, *49*(2), 24–27. https://doi.org/10.1177/0306422020935792

Anable, A. (2018). *Playing with feelings: Video games and affect*. University of Minnesota Press.

Baines, E., & Blatchford, P. (2019). *School break and lunch times and young people's social lives: A follow-up national study*. https://www.nuffieldfoundation.org/wp-content/uploads/2019/05/Final-report-School-break-and-lunch-times-and-young-peoples-lives-A-follow-up-national-study.pdf

Bird, J., & Edwards, S. (2015). Children learning to use technologies through play: A digital play framework. *British Journal of Educational Technology*, *46*(6), 1149–1160. https://doi.org/10.1111/bjet.12191

Brussoni, M., Olsen, L. L., Pike, I., & Sleet, D. A. (2012). Risky play and children's safety: Balancing priorities for optimal child development. *International Journal of Environmental Research and Public Health*, *9*(9), 3134–3148. https://doi.org/10.3390/ijerph9093134

Burgess, J., & Green, J. (2018). *Youtube: Online video and participatory culture*. John Wiley & Sons.

Cavoukian, A. (2011). *Privacy by design: The 7 foundational principles*. https://iapp.org/media/pdf/resource_center/pbd_implement_7found_principles.pdf

Close, J., Spicer, S. G., Nicklin, L. L., Uther, M., Lloyd, J., & Lloyd, H. (2021). Secondary analysis of loot box data: Are high-spending 'whales' wealthy gamers or problem gamblers? *Addictive Behaviors*, *117*, 106851. https://doi.org/10.1016/j.addbeh.2021.106851

Coleman, S., Pothong, K., & Weston, S. (2018). Dramatizing deliberation: A method for encouraging young people to think about their rights. *Journal of Public Deliberation*, *14*(1), 1–15. https://doi.org/10.16997/jdd.292

Colvert, A. (2021). *The Kaleidoscope of play in a digital world: A literature review*. R. Foundation. https://digitalfuturescommission.org.uk/wp-content/uploads/2021/06/DFC-Digital-Play-Literature-Review.pdf

Cortesi, S., Hasse, A., & Gasser, U. (2021). Youth participation in a digital world: Designing and implementing spaces, programs, and methodologies. *Berkman Center Research Publication* (2021-5).

Costanza-Chock, S. (2020). *Design justice: Community-led practices to build the worlds we need*. The MIT Press.

Coster, D., & Gleeve, J. (2008). *Give us a go! Children and young people's views on play and risk-taking*. Playday. https://www.playday.org.uk/wp-content/uploads/2015/11/give_us_a_go___children_and_young_peoples_views_on_play_and_risk_taking.pdf

Cowan, K. (2020). *A panorama of play – a literature review*. https://digitalfuturescommission.org.uk/wp-content/uploads/2020/10/A-Panorama-of-Play-A-Literature-Review.pdf

Dinsmore, B., & Pugh, A. J. (2021). The paradox of constrained well-being: Childhood autonomy, surveillance and inequality. *Sociological Forum*, *36*(2), 448–470. https://doi.org/10.1111/socf.12687

Dodd, H. F., FitzGibbon, L., Watson, B. E., & Nesbit, R. J. (2021). Children's play and independent mobility in 2020: Results from the British children's play survey. *International Journal of Environmental Research and Public Health*, *18*(8), 4334. https://doi.org/10.3390/ijerph18084334

eSafety Commissioner (Australian Government). (2019). Safety by design – principles: Placing user safety at the forefront of online service design. https://www.esafety.gov.au/sites/default/files/2019-10/SBD%20-%20%20Principles.pdf

Friedman, B., & Hendry, D. G. (2019). *Value sensitive design: Shaping technology with moral imagination*. MIT Press.

Gill, T. (2007). *No fear – growing up in a risk averse society* https://rethinkingchildhood.com/no-fear/

Gill, T. (2021). *Urban playground: How child-friendly planning and design can save cities*. Riba Publishing.

Goodley, D., & Runswick-Cole, K. (2010). Emancipating play: Dis/abled children, development and deconstruction. *Disability & Society*, *25*(4), 499–512. https://doi.org/10.1080/09687591003755914

Grimes, S. M. (2021). *Digital playgrounds: The hidden politics of children's online play spaces, virtual worlds, and connected games*. University of Toronto Press.

Hara, M., & Ovaska, S. (2014, October 26–30). Heuristics for motion-based control in games. In *Proceedings of the 8th Nordic Conference on Human-Computer Interaction: Fun, Fast, Foundational* (pp. 697–706), Helsinki, Finland. https://doi.org/10.1145/2639189.2639246

Huizinga, J. (1938). *Homo ludens: A study of the play-element in our culture*. Routledge & Kegan Paul.

Kinnula, M., Iivari, N., Molin-Juustila, T., Keskitalo, E., Leinonen, T., Mansikkamäki, E., Käkelä, T., & Similä, M. (2017). Cooperation, combat, or competence building – what do we mean when we are 'empowering children' in and through digital technology design? *Thirty Eighth International Conference on Information Systems*, http://jultika.oulu.fi/files/nbnfi-fe2018121150380.pdf

Kucirkova, N. (2021). *The future of the self: Understanding personalization in childhood and beyond*. Emerald Group Publishing.

Ladhari, R., Massa, E., & Skandrani, H. (2020). Youtube vloggers' popularity and influence: The roles of homophily, emotional attachment, and expertise. *Journal of Retailing and Consumer Services*, *54*, 1–11. https://doi.org/10.1016/j.jretconser.2019.102027

Lenhart, A., & Owens, K. (2021). *The unseen teen – the challenges of building healthy tech for young people*. D. Society. https://datasociety.net/library/the-unseen-teen/

Lester, S., & Russell, W. (2008). *Play for a change. Play policy & practice: A review of contemporary perspectives*. Play England. https://www.researchgate.net/publication/263087151_Play_for_a_Change_Play_Policy_Practice_A_Review_of_Contemporary_Perspectives

Livingstone, S., & Blum-Ross, A. (2020). *Parenting for a digital future: How hopes and fears about technology shape children's lives*. Oxford University Press.

Livingstone, S., & Pothong, K. (2021). *Playful by design: A vision of free play in a digital world*. Digital Futures Commission (London: 5Rights Foundation). https://digitalfuturescommission.org.uk/wp-content/uploads/2021/11/A-Vision-of-Free-Play-in-a-Digital-World.pdf

Livingstone, S., & Stoilova, M. (2021). The 4Cs: Classifying online risk to children. https://core-evidence.eu/updating-the-4cs-of-online-risk/

Livingstone, S., & Third, A. (2017). Children and young people's rights in the digital age: An emerging agenda. *New Media & Society*, *19*(5), 657–670. https://doi.org/10.1177/1461444816686318

Marsh, J., Plowman, L., Yamada-Rice, D., Bishop, J., Lahmar, J., & Scott, F. (2018). Play and creativity in young children's use of apps. *British Journal of Educational Technology*, *49*(5), 870–882. https://doi.org/10.1111/bjet.12622

Marsh, J., Plowman, L., Yamada-Rice, D., Bishop, J., & Scott, F. (2016). Digital play: A new classification. *Early Years*, *36*(3), 242–253. https://doi.org/10.1080/09575146.2016.1167675

Mukherjee, S., & Livingstone, S. (2020). *Children and young people's voices*. 5Rights Foundation. https://digitalfuturescommission.org.uk/wp-content/uploads/2020/10/Children-and-Young-Peoples-Voices.pdf

Mullan, K. (2019). A child's day: Trends in time use in the UK from 1975 to 2015. *The British Journal of Sociology*, *70*(3), 997–1024. https://doi.org/10.1111/1468-4446.12369

Ofcom. (2020). *Children and parents: Media use and attitudes report* 2019. Ofcom. https://www.ofcom.org.uk/__data/assets/pdf_file/0023/190616/children-media-use-attitudes-2019-report.pdf

Play England. (2012). *Adventure playgrounds: The essential elements*. https://static1.squarespace.com/static/609a5802ba3f13305c43d352/t/60b8beb51b7c4d7e9ffdae86/1622720186909/Adventure-Playgrounds.pdf

Pschetz, L., Pothong, K., & Speed, C. (2019). Autonomous distributed energy systems: Problematising the invisible through design, Drama and deliberation. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (pp. Paper 387). Association for Computing Machinery. https://doi.org/10.1145/3290605.3300617

Radesky, J., Schaller, A., Yeo, S. L., Weeks, H. M., & Robb, M. B. (2020). *Young kids and YouTube: How ads, toys, and games dominate viewing.* Common Sense Media. https://d2e111jq13me73. cloudfront.net/sites/default/files/uploads/research/2020_youngkidsyoutube-report_final-release_ forweb.pdf

Rogers, S., & Lapping, C. (2012). Recontextualising 'play' in early years pedagogy: Competence, performance and excess in policy and practice. *British Journal of Educational Studies*, *60*(3), 243–260. https://doi.org/10.1080/00071005.2012.712094

Rosen, M. (2019). *Michael Rosen's book of play: Why play really matters, and 101 ways to get more of it in your life.* Wellcome Collection.

Russell, W. (2013). Towards a spatial theory of playwork: What can Lefebvre offer as a response to playwork's inherent contradictions? In E. Ryall, W. Russell, & M. MacLean (Eds.), *The philosophy of play* (pp. 178–188). Routledge.

Sanoubari, E., Cardona, J. E. M., Mahdi, H., Young, J. E., Houston, A., & Dautenhahn, K. (2021). *Robots, bullies and stories: A remote co-design study with children* Interaction Design and Children. https://doi.org/10.1145/3459990.3460725

Schepers, S., Schoffelen, J., Zaman, B., & Dreessen, K. (2021). 'I'm the boss of the Stiemerbeek valley!' Reconsidering children's empowerment in participatory design from the perspective of infrastructuring. *CoDesign*, 1–15. https://doi.org/10.1080/15710882.2021.1912775

Sobel, K., Bhattacharya, A., Hiniker, A., Lee, J. H., Kientz, J. A., & Yip, J. C. (2017, May 6–11). It wasn't really about the Pokémon: Parents' perspectives on a location-based mobile game. *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, https://doi.org/10.1145/3025453. 3025761

Steiner, J. (2012). *The foundation of deliberative democracy. Empirical research and normative implications.* Cambridge University Press.

Stephenson, A. (2003). Physical risk-taking: Dangerous or endangered? *Early Years*, *23*(1), 35–43. https://doi.org/10.1080/0957514032000045573

Sutton-Smith, B. (1999). Evolving a consilience of play. *Play and Culture Studies*, *2*, 239–256.

Third, A., & Moody, L. (2021). *Our rights in the digital world: A report on the children's consultations to inform UNCRC General Comment 25.* 5Rights Foundation and Western Sydney University. https://5rightsfoundation.com/uploads/OurRightsinaDigitalWorld-FullReport.pdf

Thivant, L. (2018). *Child friendly cities and communities handbook.* https://www.unicef.org/eap/ reports/child-friendly-cities-and-communities-handbook

United Nations Committee on the Rights of the Child. (2013). *General Comment No. 17 on the right of the child to rest, leisure, play, recreational activities, cultural life and the arts* (Article 31) (CRC/C/GC/17). https://www.refworld.org/docid/51ef9bcc4.html

Valk, L. d., Bekker, T., & Eggen, B. (2013, June 24–27). Leaving room for improvisation: Towards a design approach for open-ended play. *Proceedings of the 12th International Conference on Interaction Design and Children*. New York, USA. https://doi.org/10.1145/2485760.2485771

Whitebread, D., Basilio, M., Kuvalja, M., & Verma, V. (2012). *The importance of play – a report on the value of children's play with a series of policy recommendations.* https://www.researchgate. net/publication/340137325_The_importance_of_play_A_report_on_the_value_of_children's_ play_with_a_series_of_policy_recommendations

Wyeth, P., & Diercke, C. (2006, November 20–24). Designing cultural probes for children. *Proceedings of the 18th Australia conference on Computer-Human Interaction: Design: Activities, Artefacts and Environments*, Sydney, Australia. https://doi.org/10.1145/1228175. 1228252