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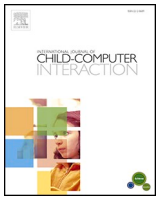

Research Paper

Play value of digital play spaces: Children's voices

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ABSTRACT

Play for plays sake emphasises the significance of how children characterise play opposed to any secondary purposes or benefits it may generate. The concept of play value draws attention to how the space in which children play proffers the experiences that children want. Increasingly, digital play experiences are emerging as spaces for play. This inquiry aims to examine the play value of digital spaces, specifically how play is afforded by the digital space from the perspective of children. Eight children aged 11 years old participated in seven focus groups, creating comic strips which were used to elicit discussions. Focus group analysis generated three themes with associated sub-themes which were collectively explained by the overarching theme of endless possibilities in play in digital spaces. This study provides a new understanding of how digital spaces affords play value from the child's perspective.

1. Introduction

Play is a right for *all* children (UNCRC, 1989) and is widely recognised as the primary occupation or activity of childhood (Lynch & Moore, 2016). Unsurprisingly, play has been defined and conceptualised by a range of disciplines without a firm consensus. What is generally accepted, however, is that play is experienced subjectively by children and characterised by feelings of joy and fun (Lester & Russell, 2008; Moore & Lynch, 2018). Yet, the instrumental benefits of play in terms of children's education, development, health, or general well-being has been widely extolled across literature, policy and societal discourse (Gleave & Cole-hamilton, 2012; Lester & Russell, 2008; Yogman et al., 2018). The Committee on the Rights of the Child, however, highlights the "intrinsic value to the child" (Committee on the Rights of the Child, 2013, p.4) that 'free play' presents, characterised by qualities such as having fun, making choices, being with other children and, where possible, devoid adult direction and intervention (Nicholson et al., 2014; Pyle & Alaca, 2018; Theobald et al., 2015). We are aware, however, that children's play shapes and is in turn shaped by the environments in which it occurs, whether that be in outdoor playgrounds using equipment such as slides and trampolines or in digital spaces interacting with virtual objects and characters that comprise games such as Fortnite or Minecraft (Arbeau et al., 2020; Livingstone & Pothong, 2022; Prins et al., 2022).

In fact, as the availability of consumer electronics such as consoles, smartphones, tablets, and other media proliferate, digital spaces rapidly emerge as a context for gaming, thus shaping children's play experiences. Children are able to access a plethora of play opportunities in online, immersive, and potentially infinite game spaces. Just as in the physical world of playgrounds and toys, digital spaces and games have been characteristically designed by adults with children in mind (Kervin et al., 2018; Lieberman et al., 2009) resulting in the design and control of games and digital play spaces that are heavily influenced by the need to achieve instrumental outcomes such as with educational games (Barreto et al., 2017; Maine, 2017) or games focussed on achieving health outcomes (De Vet et al., 2014; Dixon et al., 2010). Game spaces exist by the way in which they have been designed and involve "adult-initiated rule systems" (Grimes, 2021, p.155) resulting in opportunities for play being both promoted and constrained. Similarly, the increasing agency of software and systems are blurring the boundaries between the subjective experience and the software itself (Sicart, 2023). Despite the best efforts of adult designers, games and digital spaces may not consistently affiliate with the needs and wishes of children and may not reflect the characteristics of 'play for plays sake' that offers children valuable self-directed, motivating and fun experiences (Livingstone et al., 2023; Radesky & Hiniker, 2022; Verenikina et al., 2016). The emergence of technologies and digital spaces that simultaneously offer potentially unlimited opportunities for a wide range of play experiences while the very design of that game prescribes the nature of that experience challenges our traditional conceptualisations of play for its own sake. Across

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the literature, play in digital spaces is commonly referred to as gaming or videogaming, however, in recognition of children's rights, we will refer to play throughout this paper.

There have been several approaches and frameworks developed by way of understanding play in digital spaces. Based on Hutt's taxonomy of play (1979), Bird & Edwards' (Bird & Edwards, 2015) Digital Play Framework, proposes a model for the play opportunities that digital tools and technologies offer children. Despite its utility in understanding how technology might contribute to particular play experiences it falls short of offering insights into the experiences of children themselves and in particular the value they accrue from such play. The concept of *play value* is one way in which to understand children's experiences and is described by "the value an environment, object, or piece of equipment brings to children's experience of play" (Woolley & Lowe, 2013, p.2), or "how much play you can get out of something" (Newstead, 2004, p.29). To date, the existing research on play value has focused largely on how the design of children's play spaces in outdoor contexts (Parker & Al-Maiyah, 2022; Woolley & Lowe, 2013) and the characteristics of the environment and objects contribute to a child's perceived play value.

Existing studies focusing on the experiences of children describe characteristics of games and digital spaces that contributes to their play experience. For example, children ascribe value to the social opportunities to meet friends and maintain existing friendships that online games such as Fortnite in particular offer (Albarello et al., 2021; Carter et al., 2020). Children describe digital spaces in terms of challenge and presenting the opportunity to be challenged (Van Rooij et al., 2017), choice and creativity (Loudoun et al., 2023) with elements of fantasy and responsibility (Livingstone & Pothong, 2022; Mertala & Meriläinen, 2019). Findings from research of over 1200 children by Olson (Olson, 2010), indicated that children are motivated by the ability to experiment with different identities, and the freedom to do the impossible that wouldn't be feasible in everyday life.

As such, it is evident from some of the research above, that listening to children's descriptions of their experience playing in digital spaces provides a unique insight as to the play value that is leveraged from gaming. Furthermore, it offers an opportunity to better understand how the design of games, the composition of the digital space and the play processes that are offered contribute to children's play value. The unique insights that can be accrued from children directly as informants of their own experiences have been well established in other areas of play research (Morgenthaler et al., 2023; Wenger et al., 2023). Furthermore, given the differences in how play is conceptualised, an understanding of children's perspectives is essential in ensuring that spaces proffer valuable play experiences in line with their wants and desires (Livingstone et al., 2023; UNCRC, 1989; Wenger et al., 2023). The insights into children's perspectives is essential for professionals, parents, and game designers to ensure high value designed game spaces that denote the key characteristics of play for the main protagonist (Radesky & Hiniker, 2022). Thus, developing an understanding of play value in contemporary digital spaces in which children increasingly spend their playful time can inform opportunities to further enrich these as new technologies evolve and emerge (Livingstone & Pothong, 2022).

2. Methods of selection and participation

2.1. Study design

This qualitative study utilised a focus group design (Dahlin Ivanoff & Hultberg, 2006). A Mosaic Approach employing a multitude of data generation methods facilitated children's active involvement throughout by encouraging them to openly discuss and feel listened to (Clark, 2017). The material developed by the participants had the primary aim of enabling children to discuss and describe their own play experiences.

2.2. Participants

This study was carried out within a primary school in a large city in Ireland. The school Principal acted as the gatekeeper by disseminating age-appropriate information and consent forms to parents and children of a whole class within the school. Inclusion criteria included being enrolled in 4th class (aged 10–11 years of age), speak English, and returned completed assent forms from the children as well as consent forms from their parents. A total of eight forms were returned (3 boys, 5 girls).

2.3. Data collection

Between January and March 2022, a total of seven focus groups were completed within the school environment (see Table 1). The first two focus groups had three to five participants in each with the final focus group having no more than 3 participants to allow a more in-depth discussion of the play value of digital spaces. All focus groups were moderated by the first author (FL). Field notes were taken directly after each group focusing on first impressions of children's discussions on their play in digital spaces. Despite being conducted within the school environment, the focus groups were focused on children's typical play experiences that they would engage in. The content of *focus group one* provided participants an opportunity to freely discuss their play in digital spaces. At this group, children were provided with written instructions to take 5–10 screen shots or photographs of their play in digital spaces at home that they 'really enjoy' or 'are important' to them. Examples were provided such as something that they built in Minecraft, a favourite character, or a specific part of a game. It was requested that the pictures were of the screen itself with no faces shown on the images. These images were subsequently emailed to the group moderator by each participants' family to be printed out prior to focus group two. Throughout the *second focus group*, the participants used the images they had taken to create their own comic strip (Phelan & Kinsella, 2009). This involved cutting, sticking, and adding speech or thought bubbles to specific pictures if the participants wished. The group moderator, as in all focus groups, utilised probing questions, such as, 'why did you chose this' or 'tell me more about that' to gain further insights and to generate discussion (Dahlin Ivanoff & Hultberg, 2006). See Figs. 1 and 2 for examples of the children's pictures and comic strips created and used to generate discussion. The *third focus group* utilised the comic strips that had been created by the participants to elicit an in-depth discussion with the participants, similarly using probing questions (McCloy et al., 2016). These specific data collection methods aimed to help participants relate to their everyday experiences of play in a digital space as indicated by the Mosaic approach (Clark, 2017). All focus groups were audio recorded using Otter software, with the recordings being transcribed verbatim and cross-checked several times. Once completed, the transcripts were anonymised, and pseudonyms were assigned to each participant (see Table 1).

Table 1
Focus groups.

Session	Focus Group	Participants (pseudonyms)	Length of focus group
1	1	Freddy, Hannah, John, & Jessie	40 min
	2	Abbie, Beth, & Charlotte	25 min
2	3	Abbie, David, & Hannah	65 min
	4	Beth, Charlotte, Freddy, Jessie & John	75 min
3	5	Abbie, Beth, & Charlotte	35 min
	6	David, Jessie, & Hannah	35 min
	7	John & Freddy	20 min
Mean length of focus group			42 min

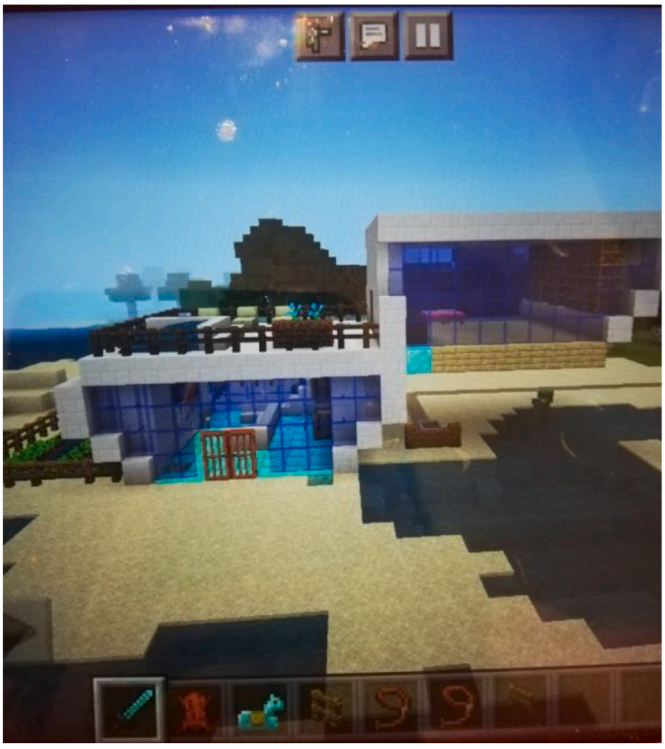
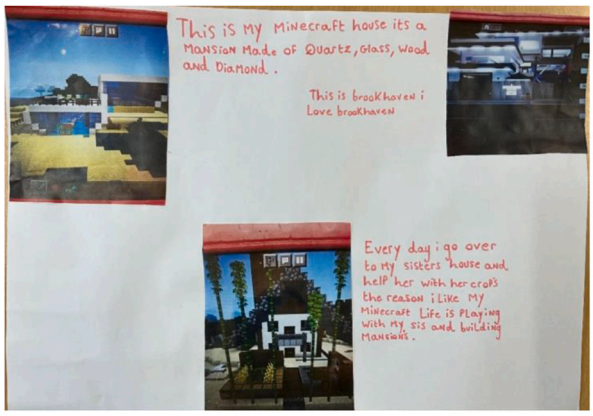
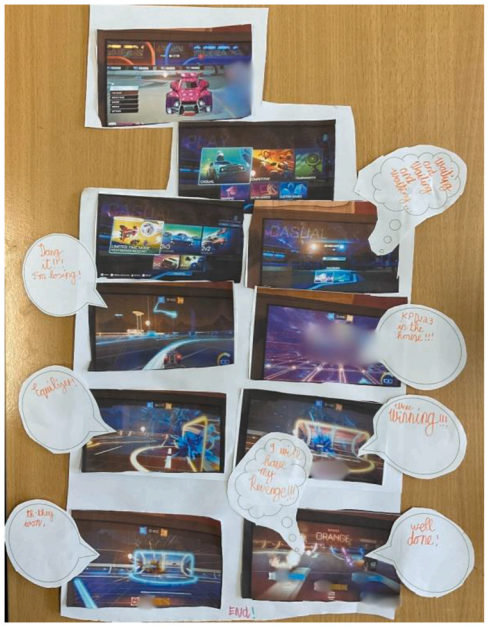


Fig. 1. Examples of pictures used in comic strips.

2.4. Data analysis

To capture the insights of children's authentic perspectives and collective discussions of the value of play in digital spaces, data was analysed according to the approach as described by Krueger & Casey (Krueger, 1997; Krueger & Casey, 2015). The transcripts from the focus





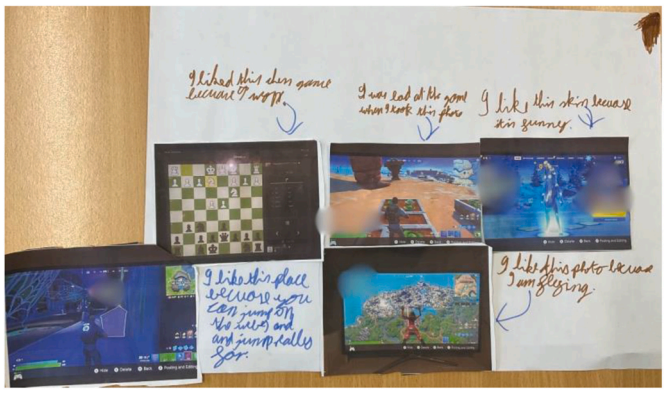


Fig. 2. Examples of comic strips.

groups were the primary focus of analysis, with the pictures, and written data on the comic strips used to clarify the context of the discussions with the children. This ensured that the analysis remained focused on the children's discussions of their play. The first step involved listening to the recordings several times. The transcripts were then read numerous times by the first author (FL) in conjunction with looking at the pictures to generate an overall sense of the focus group discussions (Krueger, 1997; Dahlin Ivanoff & Hultberg, 2006). The next step included reviewing each transcript to identify parts of the discussion which were relevant to the aim of the study. Initial codes were assigned to relevant

chunks of data and discussed by the first and second author (FL, BB), which were subsequently formed into preliminary categories. For the next step, the three authors (FL, BB, MLL) discussed the initial categories to organise them into themes and sub-themes, reflecting back to the text from the focus groups. The pictures and comic strips complemented analysis through triangulation. Evolvement of the overarching theme and themes involved a dynamic process of referring back to the coding and themes throughout analysis. Quotations throughout the findings reflect and validate the collective dialogue between the participants (Dahlin Ivanoff & Hultberg, 2006).

3. Findings

3.1. A space for endless opportunities for play

The data from children's discussions of play in digital spaces, which aimed to explore the play value of digital spaces generated three themes with associated sub-themes (see Fig. 3). These themes collectively reflect how children experience endless opportunities for play proffered by the digital space which were not necessarily accessible to them elsewhere and which were generally void of restrictions. Children discussed the variety of the demands afforded by the digital space and that the different types of games available within their play repertoire resulted in a range of play experiences. Additionally, the three main themes mutually reflect the processes in which children participate in a digital space which can evolve into their physical and social space. The first main theme describes that children discuss a space in which they continually explore new arenas, tasks, and roles which bring responsibilities as part of their play. The second theme highlights children's experiences of a place to be together and share evolving play experiences whilst the third theme explores children's discussions of a space to develop and learn which sustains play's excitement.

3.2. Continually exploring

Children's experiences reflected that the play value of digital spaces proffered continual exploration to discover new possibilities. The sub-themes establish the interconnectedness of the processes that are offered to children to explore new arenas in which to play, opportunities for new and existing tasks and roles, which collectively create an opportunity for exploring responsibilities as part of their play.

3.2.1. New arenas

The children participating in this study described the digital spaces in which they played as qualitatively different from their off-line worlds. The differences were expressed as discoveries, with new elements, features, and experiences highlighted in terms of what value that they offered. Some of the spaces in which children's play took place was described as 'discreet' or 'secret'. Children spoke of these spaces as not only allowing them to explore but to do so with an anticipation that simply being in the space could result in new, exhilarating experiences that would otherwise be unavailable to them. Consequently, they described their play itself as always changing, in response to the space in which it was happening, and the elements contained therein. The sense of reciprocal change in both their play and the space in which it occurred was characterised by one child in their comic as they described the anticipation, they experienced of how their game would end. They spoke of the spaces in which play took place in their totality, as new locations each with specific capabilities for exploring, such as 'into caves', 'up to the mountains', or around a map. Such locations demanded a type of exploration that mirrored a real-world experience, but were liberated from geographical constraints such as distance, height, and inaccessible terrain. Rather, participating children spoke of how game spaces could be simultaneous represented on a map and present as a space where children could fly to, thus co-existing simultaneously within the digital space:

> *John: Well, I'm flying and I'm going towards a new location that used to be in Fortnite but they took it out and then it's back in now. It's called tilted towers.*
>
> *Freddy: Oh, yeah.*
>
> *John: Well, it's very iconic part because when Fortnite was just out and it was really big. Like that was the place to go. They still have all like the secret places there and things like that.*

Similarly, spaces within which play occurred were described in terms of how these could be traversed. Children spoke of the satisfaction of being able to move, fly or parachute choosing different directions, influenced by going to spaces popular with other players. The freedom to explore and extend their surroundings by moving in different ways such as flying or gliding was demonstrated in one of the comic strips which revealed a participant flying above an extensive virtual landscape. Another comic portrayed their avatar waiting at a station to catch a train, thus extending their means of and possibilities for exploration.

3.2.2. New tasks and roles

Children discussed that digital spaces offered a context for exploring new tasks and roles; a space in which they could 'goof off', to do and be silly things. Children expressed that play in digital spaces conferred opportunities where they could imagine new roles for themselves to play by changing the colour and appearance of the characters they played, altering their avatar names, and experimenting with different 'skins'. New roles were described as being accompanied by a diversity of new tasks, such as mining and building in Minecraft or destroying objects and characters in Fortnite. The extent to which children took these roles seriously in their gameplay was illustrated in the comics they constructed. In these they demonstrated the extravagance of the Minecraft mansions they built in by exploiting the various materials available to them, such as, quartz, glass, and diamonds. This allowed children to structure and control their own play, thus generating new possibilities and not being necessarily constrained by the design of the game.

Specific games facilitated children's capability to pretend play different roles that they couldn't experience in real life, thus challenging boundaries typically constrained by rules or wider societal expectations:

> *Abbie: I pretend, like, I'm a robber pretending … because you can rob the bank in it and there's like a robber. Because I pretend I'm like a school girl …*
>
> *Beth: And I'm a teacher.*
>
> *Abbie: Actually, there's actually a secret base in, in in Brookhaven and when you rob the bank, you go through a vent and then it leads you to the*

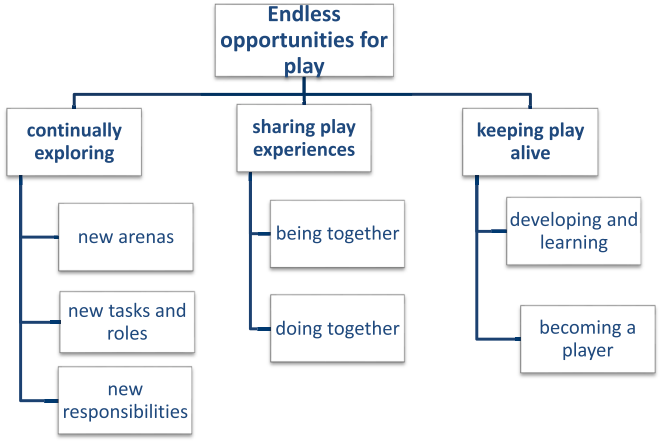


Fig. 3. Overview of themes and sub-themes.

cleaners. And then you go into a room to the right. And then you click the lights and then a trapdoor opens. Then there's like every single police camera in that room and there's like, guns and computers.

Children also discussed the possibilities to assume non-human roles, such as being different animals and the opportunities for new experiences available to these such as creating horses that they could ride through their YoYa World.

Despite expressing the range of diverse and exhilarating tasks and roles that play in a digital space offered, their discussions reflected that children were able to maintain a clear distinction between the nature of these within a digital versus a physical context:

Hannah: Like in real life, you won't have a pet ladybug who tells you, you need to go, she needs to go to the shower.

Jessie: Yeah, and you realise you wouldn't have someone come to your bed and start killing you and break your bed.

David: Or you wouldn't start driving up walls and slamming into giant balls in cars …

Children's acute understanding of the consequential nature of the roles and associated tasks and experiences was evident in their descriptions of the differences between real and digital spaces:

Hannah: Yeah, and in Brookhaven loads of people do really, really weird things. So, in real life, you wouldn't go around with someone saying like ….and since you're not actually doing it, you won't like care about safety. So, like say in real life you're having a war. You try not to get shot. But in Video games, you jump off cliffs to get better ranges …

Children's understanding of the suspension of consequences in digital spaces tendered possibilities to ignore their hitherto reality and engage in opportunities that were and were not appropriate or available to them in their physical world. Roles, such as pretending to get a job blended with taking up riskier roles and characters, for instance, being a bank robber.

3.2.3. New responsibilities

Children elaborated the potential responsibilities that grew from their game play. They described the need to grow their competence in being able to look after both themselves and their assets in their game play. Success in game play came with requirements such as building walls to protect themselves in Minecraft, raising animals in Adopt Me and looking after their farm in Slime Rancher. Upgrading their armour in Fortnite offered better protection from other players but was ultimately a responsibility that came with the roles offered by the game itself:

Jessie: you can upgrade your armour.

Hannah: yeah, you can.

John: Treasure wars is better.

Researcher: Tell me more about upgrading your armour. What does that mean?

Hannah: It means you have better protection.

Children spoke about the relationship between responsibility and perceived competence in game play where mining certain resources and materials in Minecraft earned rewards or progress their game play indicating the processes which children engage in to become competent in their play.

3.3. Sharing play experiences

Children recurrently discussed that digital spaces offered unfolding opportunities to play collaboratively with other people, specifically friends and family members. This formed two sub-themes which reflect children's value of playing together and participation in social play is characterised by evolving goals and mutual achievement.

3.3.1. Being together

Children discussed the value of digital spaces to play with other people. One comic strip depicted that children appreciated the prospect to play games in different modes, such as duo or squad mode which children spoke of facilitating play with their friends and family. Children discussed the ways in which they worked beyond the design features of games to participate in this social play. They spoke of texting their friends to decide what time to login to play the same game collaboratively. Children repeatedly expressed that they made use of other supplementary platforms such as Skype, Zoom, or FaceTime simultaneously whilst they played. Regardless of not seeing the faces of their friends, it provided an effortless and innovative opportunity for children to chat privately and play in parallel with their friends. Children spoke of initiating this during lockdown, however, sustained this despite the easing of restrictions:

Beth: Yeah, this is the way I play Roblox with friends. Well, we, Abbie, Abbie, we do like FaceTime, and we press out of it. We can still talk to each other. We don't see each other's faces and we just play the same game and then we can talk so, it's like …

Abbie: On my birthday, erm, I had a zoom call with Beth and my other friend and em, with Beth I played Roblox with her. And we still we were still able to hear each other, and it was it was loads of fun and we could choose from different games that we all wanted to play.

Children expressed that they enjoyed the potential of being able to play together whilst remotely located, sharing the same digital space yet being in separate physical spaces. Being able to play in a digital space proffered children a rapid and uncomplicated means to connect with friends and be together which tailored around other occupations in their daily routine. Play on their own or without their friends present was expressed as being boring, hence, valuing the possibilities provided to play together.

3.3.2. Doing together

Children discussed the opportunity in digital spaces to leverage the skills of friends and siblings to achieve goals collaboratively. Children spoke of assisting their younger siblings in their play and being helped by older siblings' whist on separate devices in the same online space. Comic strips demonstrated examples, such as, visiting their sister's house to help with cultivating crops or aiming at their brother in a specific game. Children expressed the value of not just playing together but also working together to achieve joint goals and maximise their in-game accomplishments. In particular, they highlighted the role older siblings play as game partners and how learning from them further extended their opportunities to develop their own skills to progress game play, enabling them to play more successfully with their own, age-equivalent peers:

Abbie: And, em, you have to try and win the game and there's 100 people in the game. And whenever I played duos, I play with my brother. And he kinda like does everything … he gets loot and weapons for me. And when I die, I mean, he's able to get this thing called a reboot card. And you can go to a reboot van within the reboot card. And you can hold down a button to get your teammate back. And my first three games I've ever played on Fortnite were wins. One was actually a solo one. It's only because the second player was like really bad …

Researcher: Does he help you when you're not playing video games?

Abbie: Um, yeah, yeah. When I'm talking to people through like a headset, I'm playing with them. He tells me what to do to …

Although these game-based social experiences were, for the most part guided by real-world social mores, children were aware that some

players found loopholes such as writing 'F space space' in the chat, challenging their sense of justice of how other players behaved and interacted in a digital space. However, children spoke of negotiating around this by turning off the chat and seeking out their preference of chatting with friends, indicating their responsibility through gameplay. Children described playing certain games when they were recommended to them by their friends or because a family member such as their brother played it. They discussed preferring to play games that were free with friends rather than games that cost money with no friends, indicating the significant social value of play in digital spaces.

3.4. Keeping play alive

Children discussed that the variation of play experiences in a digital space offered them constant and evolving opportunities to develop and learn new skills which were both relevant within the game and the physical space, thus children were inhabiting a range of spaces simultaneously. Two sub-themes reflect the children's discussions of practicing certain elements within the game which enabled them to develop as a player, both within and out with the game context.

3.4.1. Developing and learning

Children discussed that they were developing existing and learning new skills within the digital space. They recognised they developed skills such as dexterity, reflexes, strategy, tactics, and planning which they considered useful life skills. Children expressed using their knowledge of developing these skills during discussions and negotiations with their parents to play in digital spaces, demonstrating an awareness of the wider societal discourses:

David: Watching TV shows might fry your brain but video games don't cause, you're …

Hannah: You're working your brain.

Jessie: Yeah, and your fingers.

Hannah: And you can also do, I don't have any Obey's on this but it's like a lot of blocks and you've got to jump and not touch the lasers. You're using your brain.

Jessie: You're using your brain so much.

Children discussed various scenarios in their game play when they first started playing, such as picking up cabbages to heal themselves, which they were able to look back on as 'newbish'; thus, recognising the development in their gameplay. Children also expressed when they were 'newbs' they were scammed by other players, for example, who were dressed up in rags. They spoke about being challenged on their sense of justice and not understanding why other players would attempt to break the rules of the game. Children discussed the strategies employed within a digital space which incentivised them to keep playing. Daily logins for instance provided opportunities for children to earn additional prizes and develop their game play further. Children expressed that these external motivators gave them the sense that they would miss out on opportunities within the game.

From the discussions with children, the variety of games and the range of levels and difficulty resulted in constant learning and always having something to do. The continuous sense of progression indicated to children that the more you play, the better skills you possess. Children recognised the frustration in certain games, challenged by successfully playing something one day and struggling to play it the next. They spoke about play necessitating perseverance and strategies such as going away to another place then coming back to parts they found demanding. Children also discussed the degree of luck proffered by the digital space, nevertheless, the unpredictability and uncertainty during game play provided a sense of challenge and the requirement to problem solve:

Charlotte: Sometimes you have this really hard thing and can't get past it and then this other person is playing can just do it and you're like, oh my God, how do you do that? And you're just like, oh my god, and you try like a million times. Then you leave the game and come back the next day and you can do it all.

Abbie: Sometimes. I get this. It might just be a glitch. But sometimes like when I'm on my own on single player world on Minecraft, I can do loads of things that people can't believe that don't believe me. But when say my brother joins, erm, I just can't do it. Maybe it's just on single player games, but I just can't do it in front of anybody.

Beth: Or maybe it's just because of pressure. You just want to beat them and then you can't.

Children spoke about being impressed when they saw other players with cool customisations which provided inspiration of how to develop their own gameplay. They expressed that at times using default skins resulted in other players thinking you were a bad player, influencing how they were perceived by others and how the game might play out. Conversely, some players used default skins as they were inspired by their favourite YouTuber. Children learnt about different rarity of items, from 'common' loot to the more desirable and treasured 'mythic' and 'exotic' loot, which attracted and retained their play. Updates in the game Adopt Me, for example, brought new possibilities of pets which would eventually become rare, providing further opportunities to trade and brag to their friends resulting in certain elements adapting and altering in value signifying a change in value in themselves and to the children.

3.4.2. Becoming a player

Children discussed the skills that they developed and learnt in a digital space evolved into their perceived competence in play demonstrating that they recognised and understood the processes involved in their play. Children expressed that they appreciated consistent elements within the design of games such as good graphics and features, including guides to assist with aiming which supported and developed their proficiency. Thus, the use of repetitive elements in the gameplay led to competence and mastery in their play:

David: and yeah, there was a game I used to play on Xbox; Plants vs. Zombies Garden Warfare 2. The handy thing about aiming is your aim thing turns red when, there's someone in range, so you can just find that as soon as it turns red. But there's no warning if something's coming for you.

Abbie: When you're hovering, when you're aiming and when you're hovering over somebody the aim thing goes reds, which means you're like it's on target, and when you shoot, it hits them. There's also a thing called the sniper where you can look through a scope and it does so much damage you if you have a shield on you can you have one, 200 health and it does like 190 damage with one snipe. But it takes a lot to reload because it takes one bullet at a time. it's super powered!

Children discussed that by completing certain tasks and challenges in the game they earned in-game currency which progressed and enhanced their play. However, they also expressed frustration that certain elements in the game were only available eventually if they paid real world money:

Researcher: And what do you think about having to pay money for stuff?

John: Oh, I don't like

Jessie/Hannah: I don't like it

Researcher: Hannah, tell me why you don't like it?

Hannah: I don't know, cause all the better stuff and all that. If you're not allowed, like people saying you're a newb …. you're not good

Jessie: It's to tempt you to spend money

Being able to progress up levels within the game made children feel proud of themselves, that they were successful in their play and competent as individuals in general. They spoke of their experiences of the additional possibilities for play emerging from new elements or stories in the game indicating their awareness of strategies, such as updates, used by game designers to keep them playing. Children expressed the anticipation of play in digital spaces, brought by new and evolving possibilities in their play space which were not available in physical world contexts.

4. Discussion

The aim of this research was to examine children's perspectives of their play in digital spaces, specifically how the nature and composition of such space affords valuable play experiences for children. Overall, the findings indicate the value that children accrue from game spaces that facilitate their desire for exploration; both geographic (in a digital space) and material. Furthermore, digital play experiences facilitate the expression of their creativity, imagination, and craving for challenge. In this study however, children also reported the value they attributed to games that also offer a degree of familiarity and predictability.

The children in this inquiry consider digital spaces as presenting endless opportunities for play in a similar way to off-line playgrounds. Furthermore, the main themes generated from the findings identify how a range of characteristics in digital spaces contribute to the value children associate with these play experiences. These include the opportunity to continually explore new spaces, engage in novel tasks, and adopt hitherto unanticipated roles. Such characteristics were represented in children assuming new responsibilities; sharing these experiences with others; and keeping play alive through learning and developing skills. When considered collectively, these factors contribute to a new understanding of how children attribute play value to their experience in digital spaces. This can be considered reflective of how children value other dedicated play spaces, such as playgrounds, thus demonstrating some continuity between play value in the physical and digital space (Wenger et al., 2023).

The findings of this inquiry indicate that children value opportunities to continually extend their arenas of play and explore new roles which were bereft of the boundaries of their physical world. Recent studies of children's offline experiences have stressed a general decline in children's opportunities for free play over recent years (Gray et al., 2023) and more specifically a shrinking in their use of geographical space, freedom of movement and the distance from home they are allowed to travel (Karsten, 2005; Woolley & Griffin, 2015). This shift in the use of space over recent years, perpetuated by a range of social and cultural factors, has resulted in a decrease in children's sense of freedom in a physical context (Spilsbury, 2005). In offering opportunities with the promise of engaging with new experiences and exploring digital geographies in gameplay, children are tendered with an alternative space in which to exercise their rights and desire to engage in play (Livingstone et al., 2023; Livingstone & Pothong, 2022; UNCRC, 1989). Moreover, the limitations that are often experienced by children in play spaces in off-line environments is contrasted with the opportunities that digital spaces provide, which are not constrained by the physical, social, or cultural structures of the real world. The exploratory value of play in digital spaces has been recognised as a tool to enhance learning, thus, this study further indicates that children perceive its value in play for its own purpose (Toh & Kirschner, 2020).

Beyond simply presenting arenas for exploration, children recognised that the digital space also proffered opportunities to build, direct, and structure their play in the way they wished. This indicates freedom in their play as well as engaging in imaginative and creative roles and tasks. Additionally, children spoke of valuing both the learning of new and developing existing skills, which sustained the excitement of play. Bogost (2016), argues that creativity not only comes from children's sense of freedom but also the limitations set out by the game space to provide challenge and to problem solve. The wider literature indicates that children specifically pursue opportunities for imaginative play in digital spaces (Livingstone & Pothong, 2022). Thus, games such as Minecraft, YoYa World, and Pokemon which are open-ended in terms of the flexibility of play choice they offer, create a space for children to potentially explore unrealised possibilities.

Despite games in digital spaces being a largely adult-generated construct, children in the study discussed that games, nonetheless, offer opportunities to structure and control their play, using the space both flexibly and creatively. Across other studies, focussed on more traditional play environments, such as community playgrounds, where slides and swings are designed and placed there by adults, literature has indicated that children see value in the opportunities to direct and chose their play experiences for themselves. As with playground equipment, children transcend the implied intentions of game objects in digital spaces by using game characters, equipment, avatars, and others as a starting point to develop their own more varied, unanticipated, and novel expression of their play (Morgenthaler et al., 2023; Wenger et al., 2023). Children in this inquiry expressed the sense of value they got from leveraging what they saw as play potential in elements of games such as choosing to play as a bank robber, getting jobs, and building fancy houses.

Results of this inquiry indicate that children significantly value playing together with friends and family as well as being able to achieve new things together. This extends further, as children incorporate other ways and means to add layers of sociability to their game play beyond the limitations of both the game and the device. The promise of sociable engagement with others has long been associated with children's motivations for playing in the digital space (Albarello et al., 2021; Olson, 2010). The opportunity to meet other players, in particular their friend group offered a value to their digital play that is not dissimilar to the experiences children value from other play spaces (Seeland et al., 2009; Skar et al., 2016; Ziaesaeidi et al., 2023). Studies of playgrounds and play materials highlight the links between the features, layout and design with children's playability and sociability (Morgenthaler et al., 2023; Stanton-Chapman & Schmidt, 2021; Wenger et al., 2023). From this study it appears that the design and features available in game spaces, such as Roblox or Brookhaven as highlighted by participants offer the promise of dynamic social engagement and sociable play experiences which is consistent with the wider literature (Mccarthy et al., 2022). However, in the absence of technology that fully supported their expectations of meeting and chatting with their friends or peers, children demonstrated creativity and problem solving in leveraging other non-game tools such as Zoom and Skype to add additional layers of socialisation to the games they play. Further, children in this study expressed a preference and value of playing with their friends or siblings, irrespective of whether they were older or younger or of their skill level of play. Research of children's experiences of their off-line play, however, reflect their desire and perceived value of playing with other known children who are, in fact, a similar age and ability (Morgenthaler et al., 2023; Nicholson et al., 2014). Nevertheless, play with other children who are younger or older has been recognised to enhance skills and provide further opportunities for children to learn (Gray, 2011). Thus, the digital space provides a context in which children can extend their possibilities for sociability augmenting existing relationships (Albarello et al., 2021; Olson, 2010).

Within play and videogame literature, uncertainty has been recognised as key for maintaining excitement and engagement in play (Caillois, 2001; Costikyan, 2013). Specifically, Costikyan (2013) argues that the dimension of uncertainty provides players with the opportunity to manage, solve problems and overcome challenges (Costikyan, 2013; Hamlen, 2011). However, in this inquiry children expressed a value in the balance between uncertainty with elements of predictability, repetition, and familiarity in their game play. Predictable gameplay and opportunities to repeat or change the way in which they engage with games offered children a sense of familiarity in play experiences and

served to develop their understanding of the rules, strategies, and mechanics required for successful play. The value that predictability offers is of no surprise considering the role it plays across other domains such as learning and general cognitive development (Hedges et al., 2013). Further, predictability may be seen as a platform that enables children's repetitive play that further contributes to a sense of control and mastery (Crescenzi-Lanna, 2022; Hanson, 2014). This further contributed to promoting the repetitive cycles of play that is so critical to the feelings of competence often described by game players (Inal & Wake, 2022; Marsh & Tainio, 2009; Sailer et al., 2017). It has been described that the digital spaces in which children play are rule-based systems aimed to absorb the player into play experiences (Grimes, 2021; Lieberman et al., 2009). However, children in this inquiry spoke of the opportunities to be challenged and to problem solve through a variety of difficulty levels influencing their ability to master skills and play competently. Further, children expressed that the result of the challenge in the game is through a process of mastering and learning skills by overcoming certain obstacles or completing tasks faster or easier than previous (Deterding et al., 2022).

5. Limitations

This inquiry is the first of our knowledge which examines digital spaces from the perspective of play value, specifically exploring how it affords play from the perspective of children. Depth to the data collection was obtained through repeated focus groups and child-friendly methodology by creating comic strips to elicit a discussion. An heterogenous sample of boys and girls provided a varied representation of children's perspectives. However, the study was conducted within a specific geographical context which may influence the transferability of the findings to children in an alternative location. The data was discussed throughout analysis by all three authors, who had diverse experiences which increased trustworthiness and sensitivity. Research has typically been conducted in silo's, focusing on specific spaces in which children play, such as the natural, built, or digital environment. However, children do not distinguish between spaces and see a fluidity across contexts, therefore, further research from the perspective of the child is necessarily which examines play in digital spaces as part of their play repertoire.

6. Conclusion

We can conclude from this study that children perceive high play value in digital spaces through endless opportunities resulting from a complex and collective blend of characteristics that have the potential to be designed into and within the digital space. Game spaces which facilitate children's desire for exploration, their expression of creativity, sociability, and those which offer familiarity and predictability are suggested to denote high play value. Thus, by not restricting children to a few certain games and spaces whilst providing a plethora of opportunities for children to engage in different ways, a breadth of play value is accrued. Further, these findings can be used to demonstrate how a digital space can be designed to create experiences with high play value. Whilst acknowledging the exploratory nature of the study along with play value being a largely under researched construct, the development of a framework may be helpful. This would determine the indicators of play value alongside the opportunities afforded by the digital space from the child's perspective to aid in designing and achieving high play value play spaces.

Selection and participation

The children in this study were recruited from a primary school in a large city in Ireland. The school Principal acted as the gatekeeper by disseminating age-appropriate information and consent forms to parents and children of a whole class within the school. Children were able to participate in the study if both their parent consent form and their own assent form were fully completed and returned. During all the focus groups, children were informed that their participation was completely voluntary and that they could withdraw at any time. Ethical approval was given by University College Cork's Social Research and Ethics Committee (Log 2021-110) and the Swedish Ethical Review Board (Log 2021–03411).

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CRediT authorship contribution statement

Fiona M. Loudoun: Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. **Bryan Boyle:** Conceptualization, Formal analysis, Supervision, Writing – review & editing. **Maria Larsson-Lund:** Conceptualization, Formal analysis, Supervision, Writing – review & editing.

Declaration of competing interest

The authors report that there are no competing interests to declare.

Data availability

Data will be made available on request.

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References

Albarello, F., Novoa, Á., Castro Sánchez, M., Velasco, A., Novaro Hueyo, M. V., & Narbais, F. (2021). The social dynamics of multiplayer online videogames in Argentinian and Chilean family contexts: The case of Fortnite. *Glob Stud Child* [Internet] https://www.scopus.com/inward/record.uri?eid=2-s2.0-85106244278&doi=10.1177%2F2043610621015997&partnerID=40&md5=27dc83b4300f21d653215a48fcf5a0ea.

Arbeau, K., Thorpe, C., Stinson, M., Budlong, B., & Wolff, J. (2020). The meaning of the experience of being an online video game player. *Comput Hum Behav Reports, 2* (April), Article 100013. https://doi.org/10.1016/j.chbr.2020.100013 [Internet].

Barreto, D., Vasconcelos, L., & Orey, M. (2017). Motivation and learning engagement through playing math video games. *Malaysian J Learn Instr, 14*(2), 1–21.

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.

Bogost, I. (2016). *Play Anything: The pleasure of limits, the uses of boredom, & the secret of games*. New York, NY: Basic Books.

Caillois, R. (2001). *Man, play and games*. University of Illinois Press.

Carter, M., Moore, K., Mavoa, J., Horst, H., & Gaspard, L. (2020). Situating the appeal of fortnite within children's changing play cultures. *Games and Culture, 15*(4), 453–471.

Clark, A. (2017). *Listening to young children: A guide to understanding and using the mosaic approach* (3rd ed.). London: Jessica Kingsley Publishers.

Committee on the Rights of the Child. (2013). General comment No. 17 (2013) on the right of the child to rest, leisure, play, recreational activities, cultural life and the arts (art. 31). *United Nations, 21*(2), 35–44.

Costikyan, G. (2013). *Uncertainty in games (playful thinking series)*. MIT Press.

Crescenzi-Lanna, L. (2022). The developmental appropriateness of digital games and its impact on young children's enjoyment and playtime. *Int J Child-Computer Interact [Internet, 33*, Article 100480. https://doi.org/10.1016/j.ijcci.2022.100480

Dahlin Ivanoff, S., & Hultberg, J. (2006). Understanding the multiple realities of everyday life: Basic assumptions in focus-group methodology. *Scandinavian Journal of Occupational Therapy, 13*(2), 125–132.

De Vet, E., Simons, M., & Wesselman, M. (2014). Dutch children and parents' views on active and non-Active video gaming. *Health Promotion International, 29*(2), 235–243.

Deterding, S., Andersen, M. M., Kiverstein, J., & Miller, M. (2022). Mastering uncertainty: A predictive processing account of enjoying uncertain success in video game play. *Frontiers in Psychology, 13*(July), 1–16.

Dixon, R., Maddison, R., Mhurchu, C. N., Jull, A., Meagher-Lundberg, P., & Widdowson, D. (2010). Parents' and children's perceptions of active video games: A focus group study. *Journal of Child Health Care, 14*(2), 189–199.

Gleave, J., & Cole-hamilton, I. (2012). *A literature review on the effects of a lack of play on children's lives*. Play England. Available from: http://www.playengland.org.uk/media/371031/a-world-without-play-literature-review-2012.pdf.

Gray, P. (2011). The special value of children's age-mixed play. *American Journal of Play, 3*(4), 500–522.

Gray, P., Lancy, D. F., & Bjorklund, D. F. (2023). Decline in independent activity as a cause of decline in children's mental well-being: Summary of the evidence. *J Pediatr [Internet], 260*, Article 113352. https://doi.org/10.1016/j.jpeds.2023.02.004

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

Hamlen, K. R. (2011). Children's choices and strategies in video games. *Computers in Human Behavior, 27*(1), 532–539.

Hanson, C. (2014). Repetition. In *The routledge companion to video game studies* (1st ed.). Abingdon: Routledge.

Hedges, J. H., Adolph, K. E., Amso, D., Bavelier, D., Fiez, J. A., Krubitzer, L., et al. (2013). Play, attention, and learning: How do play and timing shape the development of attention and influence classroom learning? *Annals of the New York Academy of Sciences, 1292*(1), 1–20.

Inal, Y., & Wake, J. (2022). An old game, new experience: Exploring the effect of players' personal gameplay history on game experience. *Univers Access Inf Soc [Internet], 22*(3), 757–769. https://doi.org/10.1007/s10209-022-00872-0

Karsten, L. (2005). It all used to be better? Different generations on continuity and change in urban children's daily use of space. *Children's Geographies, 3*(3), 275–290.

Kervin, L., Verenikina, I., & Rivera, C. (2018). Digital play and learning in the home: Families' perspective [internet]. *International Perspectives on Early Childhood Education and Development. School of Education, Faculty of Social Science, University of Wollongong, 22*, 117–130. Wollongong, Australia: Springer https://www.scopus.com/inward/record.uri?eid=2-s2.0-85047027765&doi=10.1007%2F978-981-10-6484-5_8&partnerID=40&md5=c05debf3f7137f234a1a0dd6d0262129.

Krueger, R. (1997). *Analyzing and reporting focus group results* (1st ed.). SAGE Publications Inc.

Krueger, R., & Casey, M. A. (2015). *Focus groups: A practical guide for applied research* (5th ed.). Thousand Oaks, CA: SAGE Publications Ltd.

Lester, S., & Russell, W. (2008). *Play england (project), national children's bureau. Play for a change : Play, policy and practice : A review of contemporary perspectives : Summary report*. National Children's Bureau. Published by Play England by the.

Lieberman, D. A., Fisk, M. C., & Biely, E. (2009). Digital games for young children ages three to six: From research to design. *Comput Sch, 26*(4), 299–313.

Livingstone, S., Ólafsson, K., & Pothong, K. (2023). *Digital play on children's terms: A child rights approach to designing digital experiences*. New Media Soc.

Livingstone, S., & Pothong, K. (2022). Imaginative play in digital environments: Designing social and creative opportunities for identity formation. *Information, Communication & Society, 25*(4), 485–501.

Loudoun, F. M., Boyle, B., & Larsson-Lund, M. (2023). Making choices in digital play spaces: Children's experiences. *Scand J Occup Ther [Internet], 30*(8), 1460–1471. https://doi.org/10.1080/11038128.2023.2271050

Lynch, H., & Moore, A. (2016). Play as an occupation in occupational therapy. *British Journal of Occupational Therapy, 79*(9), 519–520.

Maine, F. (2017). The bothersome crow people and the silent princess: Exploring the orientations of children as they play a digital narrative game. *Literacy, 51*(3), 138–146.

Marsh, A. P., & Tainio, L. (2009). Other-repetition as a resource for participation in the activity of playing a video game. *The Modern Language Journal, 93*(2), 153–169.

Mccarthy, K., Rice, S., Flores, A., Miklos, J., Nold, A., Mccarthy, K., et al. (2022). Exploring the meaningful qualities of transactions in virtual environments for massively multiplayer online role-playing gamers. *Journal of Occupational Science, 0*(0), 1–13. https://doi.org/10.1080/14427591.2022.2108884 [Internet].

McCloy, L., White, S., Bunting, K. L., & Forwell, S. (2016). Photo-elicitation interviewing to capture children's perspectives on family routines. *Journal of Occupational Science, 23*(1), 82–95.

Mertala, P., & Meriläinen, M. (2019). The best game in the world: Exploring young children's digital game–related meaning-making via design activity. *Glob Stud Child, 9*(4), 275–289.

Moore, A., & Lynch, H. (2018). Understanding a child's conceptualisation of well-being through an exploration of happiness: The centrality of play, people and place. *Journal of Occupational Science, 25*(1).

Morgenthaler, T., Schulze, C., Pentland, D., & Lynch, H. (2023). Environmental qualities that enhance outdoor play in community playgrounds from the perspective of children with and without disabilities: A scoping review. *International Journal of Environmental Research and Public Health, 20*(3).

Newstead, S. (2004). *The busker's guide to playwork*. Eastleigh: Common Threads Publications Ltd.

Nicholson, J., Shimpi, P. M., Kurnik, J., Carducci, C., & Jevgjovikj, M. (2014). Listening to children's perspectives on play across the lifespan: children's right to inform adults' discussions of contemporary play. *Int J Play, 3*(2), 136–156 [Internet] https://www.scopus.com/inward/record.uri?eid=2-s2.0-84924529977&doi=10.1080%2F21594937.2014.937963&partnerID=40&md5=7a051e2dc147be53d0092585a6c78b99.

Olson, C. K. (2010). Children's motivations for video game play in the context of normal development. *Review of General Psychology, 14*(2), 180–187.

Parker, R., & Al-Maiyah, S. (2022). Developing an integrated approach to the evaluation of outdoor play settings: Rethinking the position of play value. *Child Geogr [Internet], 20*(1), 1–23. https://doi.org/10.1080/14733285.2021.1912294

Phelan, S., & Kinsella, E. A. (2009). Occupational identity: Engaging socio-cultural perspectives. *Journal of Occupational Science, 16*(2), 85–91.

Prins, J., van der Wilt, F., van der Veen, C., & Hovinga, D. (2022). Nature play in early childhood education: A systematic review and meta ethnography of qualitative research. *Frontiers in Psychology, 13*(November), 1–15.

Pyle, A., & Alaca, B. (2018). Kindergarten children's perspectives on play and learning. *Early Child Dev Care [Internet], 188*(8), 1063–1075. https://doi.org/10.1080/03004430.2016.1245190

Radesky, J., & Hiniker, A. (2022). From moral panic to systemic change: Making child-centered design the default. *Int J Child-Computer Interact, 31*, Article 100351. https://doi.org/10.1016/j.ijcci.2021.100351 [Internet].

Sailer, M., JU, H., Mayr, S. K., & Mandl, H. (2017). How gamification motivates: An experimental study of the effects of specific game design elements on psychological need satisfaction. *Computers in Human Behavior, 69*, 371–380. https://doi.org/10.1016/j.chb.2016.12.033 [Internet].

Seeland, K., Dübendorfer, S., & Hansmann, R. (2009). Making friends in Zurich's urban forests and parks: The role of public green space for social inclusion of youths from different cultures. *For Policy Econ, 11*(1), 10–17.

Sicart, M. (2023). *Playing software* (1st ed.). Cambridge, Massachusetts: MIT Press.

Skar, M., Gundersen, V., & O'Brien, L. (2016). How to engage children with nature: Why not just let them play? *Child Geogr [Internet], 14*(5), 527–540. https://doi.org/10.1080/14733285.2015.1136734

Spilsbury, J. C. (2005). 'We don't really get to go out in the front yard'-Children's home range and Neighborhood Violence. *Children's Geographies, 3*(1), 79–99.

Stanton-Chapman, T. L., & Schmidt, E. L. (2021). How do the children play? The influence of playground type on children's play styles. *Frontiers in Psychology, 12*(October).

Theobald, M., Danby, S., Einarsdóttir, J., Bourne, J., Jones, D., Ross, S., et al. (2015). Children's perspectives of play and learning for educational practice. *Educ Sci, 5*(4), 345–362.

Toh, W., & Kirschner, D. (2020). Self-directed learning in video games, affordances and pedagogical implications for teaching and learning. *Computer Education, 154*(April), Article 103912. https://doi.org/10.1016/j.compedu.2020.103912 [Internet].

UNCRC. (1989). *The united nations convention on the rights of the child*.

Van Rooij, A. J., Daneels, R., Liu, S., Anrijs, S., & Van Looy, J. (2017). Children's motives to start, continue, and stop playing video games: Confronting popular theories with real-world observations. *Curr Addict Reports, 4*(3), 323–332 [Internet] https://www.scopus.com/inward/record.uri?eid=2-s2.0-85032691385&doi=10.1007%2Fs40429-017-0163-x&partnerID=40&md5=1f839e463542050655l5f4351a05b3a1.

Verenikina, I., Kervin, L., Rivera, M. C., & Lidbetter, A. (2016). Digital play: Exploring young children's perspectives on applications designed for preschoolers. *Glob Stud Child, 6*(4).

Wenger, I., Lynch, H., Prellwitz, M., Schulze, C., Wenger, I., Lynch, H., et al. (2023). Children ' s experiences of playground characteristics that contribute to play value and inclusion : Insights from a meta-ethnography. *J Occup Sci [Internet, 0*(0), 1–28. https://doi.org/10.1080/14427591.2023.2248135

Woolley, H. E., & Griffin, E. (2015). Decreasing experiences of home range, outdoor spaces, activities and companions: Changes across three generations in sheffield in north england. *Child Geogr [Internet], 13*(6), 677–691. https://doi.org/10.1080/14733285.2014.952186

Woolley, H., & Lowe, A. (2013). Exploring the relationship between design approach and play value ofOutdoor play spaces. *Landscape Research, 38*(1), 53–74.

Yogman, M., Garner, A., Hutchinson, J., Hirsh-Pasek, K., Golinkoff, R. M., Baum, R., et al. (2018). The power of play: A pediatric role in enhancing development in young children. *Pediatrics, 142*(3).

Ziaesaeidi, P., Cushing, D. F., Washington, T., & Buys, L. (2023). "Just to make new friends and play with other children": Understanding youth engagement within neighbourhood parks using a Photo-Choice tool. *Landscape and Urban Planning*, 235.

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